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MEDICINE AND THE MEDICAL AGE

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ORIGINAL COMMUNICATIONS.

BLOOD TRANSFUSION VIA LONGITUDINAL SINUS, WITH REPORT OF CASES.[1]

BY HARRY LOWENBURG, A.M., M.D.,

Pediatrist to the Mount Sinai Hospital, and to the Jewish Hospital, Philadelphia.

Transfusion as a valuable therapeutic measure still remains unappreciated. The ease with which the longitudinal sinus route may be employed and the simplicity of the technique are but too little understood. It is desired to emphasize the protean indications calling for transfusion, to discuss the availability and advantages of the sinus route, to detail technique, to point out the dangers and failures by this method as learned from personal experience, and to record the results of 13 transfusions done in this manner.

1. *General Indications for Transfusion in Infancy.*—In spite of tremendous advances made in bacteriology, serology, and in physiological and bio-chemistry, the etiology of most diseases still remains practically unsolved. By this is meant that the active ultimate agent, which, coming into the most intimate contact with the ultimate body element, causes the change from normality to abnormality—the latter, together with the resulting perversion of function, constituting that which we call disease—still in the majority of instances, together with its manner of acting, remains shrouded in mystery. It is not sufficient to say that the pneumococcus causes pneumonia, that the Eberth bacillus causes typhoid fever, that the Koch organism causes tuberculosis. This is only the beginning. The exact nature and the manner of action of the toxins of these various organisms are even yet but little understood. Why one causes fibrin exudate in the air vesicles, the other having a selective necrotic action upon certain lymph areas situate in the small intestines, and the last a coagulation and destructive digestive action upon all susceptible, particularly pulmonary and lymph, tissues, is still not known and not soon likely to be.

The proof of the insufficiency of the designation of a particular microörganism as the causative factor of a certain ensemble of symptoms, which we inadequately nominate as a certain disease, is given by the common human experience that the discovery of the germ is not immediately followed by the destruction of that disease. This is because the organism is ubiquitous. Since we are unable to destroy it, and possessing a very meager knowledge or none at all as to its ultimate method of development in the body, and being still more in the dark as to the final method of interaction between it or its toxins or both and the tissues with which they come in contact—*i.e.*, the ultimate etiology of the particular disease—we are helpless to stay its natural progress, ending either in the recovery or the death of the host. Therefore, whether we like it or not, we must acknowledge, at least to ourselves, that in the majority of the acute infections we sit at the bedside helpless to assist in recovery, but often potent for harm by reason of meddlesome interference by means of rest-disturbing measures! In

[1]Read before the Philadelphia Pediatric Society, Feb. 9, 1920.

truth the same applies in principle as well to the afebrile diseases—those which result presumably from a slower but just as certain perversion in body chemistry—the so-called deficiency diseases—the ones dependent upon diet; for instance malnutrition, rickets, scurvy, eczema, asthma.

If now we are willing to acknowledge our inability to determine the etiology of disease as we now understand that term, we may assume, with a reasonable degree of assurance, that the causative agent or agents are carried to their ultimate sphere of activity by the blood—a compound nutritive circulating medium of extreme complexity which contains not only the elements which maintain nutrition and promote growth, but protective bodies, as well as those sinister ultimate etiologic factors of disease to which reference has just been made. We have long recognized the struggle for existence which goes on between these last two agents. The complete or partial ascendancy of the one over the other represents recovery or death or partial recovery. Hence we may reasonably assume that the tide may be favorably turned by supplying the host with an extra amount of antitoxin or combative agents. We may, for the time at least, resort to transfusion as a method to supply fresh healthy combative blood, representing the best antitoxic and antimicrobic agent to date revealed to us. Thus perhaps may we treat many more diseases successfully by this method than at present we are doing. Further, if used sufficiently early may not the term "aborting" as applied to checking or cutting short of a well-recognized malady become a reality and not remain, as now, a chimera? Rather than expose myself to the criticism of radicalism or of becoming reactionary, by naming specific entities amenable to this form of therapy, I prefer to trust to your imaginations to conjure up instances of diseases which may be amenable to transfusion.

2. *Availability of the Longitudinal Sinus.*—The difficulty experienced in entering the veins of infants under two years of age and the ease with which they collapse have had a markedly deterrent influence upon the practice of transfusion at this age. In spite of the many ingenious methods devised by means of which transfusion may be successfully accomplished with this class of patients, nevertheless it is done with extreme difficulty and requires special training and, usually, elaborate technique and apparatus. All of these may not be available when life may depend upon minutes or seconds uselessly employed in preparation!

It is known that the anterior fontanel remains open up to the eighteenth month. In many instances it remains patulous even longer. This is particularly so in some diseases wherein conditions may arise which are particularly benefited by transfusion—rickets, for instance. The longitudinal sinus traverses this opening in the calvarium directly in the middle line from its posterior to its anterior angle. In the former situation, for all practical purposes, it lies just beneath the skin. Hence it is readily available to puncture and may be pierced without danger to neighboring structures. So close to the surface does it lie that the danger from subdural or epidural oozing and subsequent coagulation is slight, because bleeding, after withdrawal of the needle, may be readily controlled by slight rotary pressure applied for three to five minutes.

The walls of the sinus are not rigid. Neither are they adherent to bony structures to such an extent as not to admit of considerable distention of the channel without rupture. Hence the introduction of fluid, be it saline, sugar solution, salvarsan, or other properly prepared medicament in solution, or blood, becomes a matter of comparative ease.

The sinus route is available until the ossification of the covering membrane of the fontanel is practically complete—as long as there is a feeling of resiliency to slight pressure of the index-finger or as long as cerebral pulsations can be detected. In fact ossification may be pretty well advanced even before this pathway is no longer available. It may be used as long as it may be readily pierced by a needle. However, it must not be forgotten that bleeding, follow-

ing withdrawal of the needle, is not so readily controlled by pressure when the covering membrane is rigid.

3. *Technique.*—Four persons are needed to successfully carry out transfusion by this method—two nurses and two physicians. In emergency the thing may be accomplished with less, and the idea need not be abandoned because of lack of trained assistants. Team work, however, makes for success. In cases in which hurry is not necessary the procedure should be discussed previously by those who are to take part in the work. Each is assigned his or her duty, and he or she should rehearse it well in his or her mind. Then the whole should be enacted in pantomime by all the prospective participants together until there is no hitch. The director should be the physician in charge, and all the rest must be submissive to his will and must be cautious to initiate no new maneuver, previously unknown to the rest, during the actual performance of the operation. Such an act may be fatal to a successful transfusion—though not necessarily fatal to the patient.

The infant's body is so wrapped that his limbs are immobilized much after the manner of preparation for tracheotomy. The infant lies prone upon a table of such a height that the operator, at its head, may work at ease and comfort while *sitting*. His hands when resting on the table must be about on a level with the anterior fontanel, and under no circumstances must his position be cramped so as to cause him to point the needle from above or from below or from the side, but directly from in front of him. One nurse holds the infant's head firmly in the hollow of both her hands with fingers interlocked under its head. Hence the head actually rests upon her hands and not upon the table. The palms of her hands are most advantageously placed over the infant's ears. In this position she has a certain leverage, which allows absolute control of the head, which she slightly flexes upon the chest. Her grasp must be firm and her hold steady. In one instance temporary failure resulted from the fact that the nurse, unknown to me, suffered pain from sunburned arms. She was unable to remain still and moved during the most delicate part of the operation.

The other nurse acts as general assistant at the instrument table and passes the blood-filled syringes from the assistant physician, who is stationed at the side of the donor withdrawing blood regularly in 50-Cc. Luer syringes, to the operator who injects the blood into the recipient.

Apparatus required: Several needles, at least a half-dozen, of 1/16-inch bore. Each needle should contain within its bore a brass wire which must show at both ends to insure patency. A plugged needle may be discovered at the wrong moment and thus delay or spoil the entire procedure. The tips of the needle must be sharp but not too pointed, and the flange must not be too long because the sinus lies so close to the surface that the tip of the needle may be within the lumen of the sinus before the opening in the needle is covered. This may result in subdural or epidural oozing.

In addition there are needed a 10-Cc. Luer glass syringe and two or three 50-Cc. Luer glass syringes. The latter must be provided with special metal tips which will fit accurately into the needle which fits the 10-Cc. syringe. Sterile normal saline solution, sterile 1-per-cent sodium citrate solution, iodine, alcohol, rubber gloves, green soap, a good razor, rubber tubing to be used as a tourniquet on the donor, a couple of hemostats to hold the latter in place, gauze and cotton, complete the list of necessities. The syringes and the needles are sterilized by boiling in weak soda solution and not by immersion in alcohol, otherwise coagulation of blood within the syringe or within the needle may ensue.

The area over the fontanel is shaved, although this is unnecessary. It is painted with iodine. The posterior angle of the anterior fontanel is accurately located by the index-finger of the left hand. The 10-Cc. Luer syringe with the needle attached is partly filled with sterile saline solution. The tip of the needle is plunged just beneath the surface of the skin exactly in the middle line in the posterior angle. As the

tip enters the lumen of the sinus the fact is revealed by the appearance of blood within the lumen of the syringe. Meanwhile the associate physician is filling a 50-Cc. syringe (Luer) with the blood of the donor. The physician at the head of the child keeps gently pushing and pulling the plunger of his 10-Cc. syringe in and out, thus preventing blood coagulation and keeping patulous the lumen of the syringe and the needle. A nurse meanwhile sprays ether or ethyl chloride upon the barrel of the 50-Cc. syringe into which the blood of the donor is being drawn. As this syringe is filled it is disconnected from the needle, which is allowed to remain *in situ* in the vein of the donor. The nurse passes this blood-filled syringe from the associate physician to the operator, who disconnectes his 10-Cc. Luer syringe containing the saline, allowing the needle, whose tip rests within the lumen of the sinus, to remain *in situ*. This needle is steadied with the operator's left hand. The blood-containing 50-Cc. Luer syringe is quickly connected with the needle and the plunger is gently but firmly and continuously pushed home. Meanwhile the associate physician, at the donor's arm, is filling with blood another 50-Cc. Luer syringe previously washed out by the nurse with the sterile citrated (1 per cent) solution. He finishes the filling of his syringe just as the last of the blood has been delivered by the operator into the lumen of the sinus. The operator rapidly disconnects, hands the emptied syringe to the nurse as she passes him another 50-Cc. Luer syringe filled with blood handed to her by the associate physician. This movement between the three must be harmonious. While both physicians are now preoccupied—one at the donor's arm and the other at the infant's head—the nurse is washing out quickly but thoroughly with the citrate solution the soiled syringe just handed her. Thus this action between the three is maintained until 150 to 250 Cc. of blood have been injected into the recipient. The amount varies according to the age and size of the infant and the severity of the case. Needles are withdrawn from recipient and donor. Bleeding in the latter is controlled by removing the tourniquet and by elevating the arm and applying pressure for a few minutes over the site of puncture. In the recipient rotary pressure is applied for a short period over the fontanel at its posterior angle. A bandage is applied and the infant returned to bed or sent home.

During the process of injecting, the operator may know that he is within the lumen of the sinus by the fact that no swelling is raised. Should this occur, the procedure must, for the time being at least, be halted and taken up again on a later day. Usually no harm accrues to the patient, as I have witnessed that even after a hematoma of considerable size had appeared it was rapidly absorbed. But the process may not be repeated again with ease until all landmarks are again clear.

In 13 transfusions done via the sinus route I have witnessed no untoward or serious effects. In one, a new-born, after about 80 Cc. had been introduced—the injecting syringe being in charge of an associate, this being his first experience with the sinus route, myself being the donor—rather a large hematoma formed, with, however, no serious effect. The infant survived. This case will be reported later.

In another instance the baby held its breath, became cyanosed and unconscious, and had slight convulsive movements. The transfusion was interrupted. At the time the phenomenon was thought to be due to anaphylactic shock, although the donor was the father. The local conditions at the site of injection were perfect and some 100 Cc. of blood had already entered. Later it was determined, although it did not at the time appear in the history, that the child had had these attacks for the previous two months and that one was always readily inaugurated each time the infant became frightened or was crossed in any way. Later investigation revealed spasmophilia. Four subsequent transfusions were done on this baby. Breath holding, convulsions, unconsciousness recurred once or twice, but they were not permitted to interfere with the transfusion. This patient finally recovered in

every way. The improvement in its blood undoubtedly cured its spasmophilia. It occurs to me whether or not deficiency in the calcium of the blood, which must be a part of every severe anemia, the blood being reduced in this as it is in all its other elements, may not be responsible for this state of nervous excitability, which we term spasmophilia in this instance, and epilepsy perhaps when it assumes a somewhat different aspect. Also, if this be so, may we not possess in transfusion a means of combating or at least improving these morbid states? My own experience at least seems to lend some color of truth to this assumption, for in no less than in six or seven instances have I seen cases of spasmophilia in which anemia was a prominent feature entirely recover, when the anemia was actively treated either by transfusion or by the continuous administration of arsenic and iron and proper food.

When conditions in the scalp are normal the sinus, as stated, lies practically underneath the skin. Where, however, edema or swelling of any kind exists this must be taken into consideration when inserting the needle, and the latter may have to be inserted a half-inch or more before the point enters the lumen of the sinus. I have experienced this where the skin was swollen as the result of an ice-bag burn. The operator must, however, be sure of his ground before plunging the needle deeply.

In very young infants, or those whose heads are distended by hydrocephalus, the landmarks of the anterior fontanel are not always clearly defined. This is especially so where the size of the fontanel is unusually large. An imaginary line must then be drawn backward from the anterior angle and the needle inserted directly in the middle at a point about where the posterior angle may be assumed to be.

Sometimes the needle becomes plugged from coagulated blood and it is impossible to push the plunger of the syringe further. Another needle must be quickly substituted, care being taken that the second needle is accurately placed. The procedure then continues to completion.

The immediate effect of transfusion by any method is almost dramatic. The infant's tissues become suffused and glow with the ruddiness of apparent health. The ears, the toes, the finger-tips, the nose, the lips and all visible mucous surfaces, which before were pale and blanched, become red and lifelike.

Immediate examination of the blood often shows a tremendous polycythemia, leucocytosis, and sometimes over 100 per cent of hemoglobin—*i.e.*, all the blood elements are increased. During the next twenty-four hours the secondary effects become apparent. The infant becomes pale again, but not so pale as before, and microscopic examination shows a marked reduction in all blood elements. Gradually these again increase and the general outward appearance of the patient improves. This last may be designated the permanent effect and results no doubt from the stimulating effect upon the blood-making organs as well as from the destructive antitoxic and antimicrobic, in a word from the antietiologic, influence of the fresh blood.

There is often a rapid rise in temperature immediately following transfusion. The pulse becomes rapid and the urine shows heavy deposits of urates. These phenomena, however, speedily disappear. On one or two occasions a small amount of air entered the blood stream, apparently, however, without causing any ill effect.

I have transfused 14 children. Only those done via the sinus route will be described in some detail. The others will be briefly mentioned first, with the indication and the result designated.

Case 1.—Nephritis with edema. Transfused twice. No result.

Case 2.—Nephritis with edema. Transfused once. Splendid result.

Case 3.—Lymphatic leukemia. Transfused once. No effect.

Case 4.—Epidemic influenza. Transfused while patient moribund. Apparently prolonged life.

Case 5.—Acidosis. Unconscious and moribund. Transfused once. Died.

Cases 6, 7, 8.—Hemophilia. Transfused

each once. Recovery and marked general improvement.

TRANSFUSION VIA SINUS ROUTE.

H. McD., 18 months. Referred by Rose S. Rubin, M.D. Complaint, extreme pallor and bloody stools for nearly a year.

3-9-18—Hb. 30 per cent, R. B. C. 2,460,000, W. B. C. 14,400, Pmn. 53 per cent, S. M. 47 per cent, anisocytosis marked. Reds stain poorly. Careful study failed to reveal the cause either of the intestinal bleeding or of the anemia.

3-25-18—Transfusion via sinus route; 200 Cc. injected at Mt. Sinai Hospital.

3-26-18—Temperature 100°, pulse 140, respiration 40. Paler than immeditely after transfusion.

3-27-18—Hb. 50 per cent, R. B. C. 3,800,000, temperature normal. Normal blood-free constipated movement—the first blood-free movement in months. It may be remarked that no more blood appeared in the stools while this infant remained under my observation.

4-1-18—250 Cc. blood injected via sinus route.

4-3-18—Hb. 65 per cent, R. B. C. 4,740,000, W. B. C. 15,000, Pmn. 71 per cent, S. M. 24 per cent, L. M. 5 per cent. Associate, Dr. A. I. Rubenstone. This child has still remained in health and appears ruddy and well.

J. L., 2½ years. Mt. Sinai Hospital, service of Dr. M. Behrend. Nose bitten off by rat. Severe bleeding at the time. Marked secondary anemia. Also had bronchopneumonia and has rickets. Unfortunately blood records lost. Transfused twice via sinus route. Splendid permanent effect. Associate, Dr. A. I. Rubenstone.

M. S., aged 18 months. Mt. Sinai Hospital, service of Dr. S. Seilikovitch. Primary anemia. Hb. 20 per cent, R. B. C. 1,960,000, W. B. C. 9800, Pmn. 50 per cent, S. M. 48 per cent, L. M. 10 per cent. Anisocytosis and poikilocytosis marked.

5-25-18—Transfusion via sinus route; 200 Cc. injected.

5-27-18—Hb. 35 per cent, R. B. C. 3,890,000, W. B. C. 14,600, Pmn. 43 per cent, S. M. 55 per cent, L. M. 1 per cent, mast 1 per cent (after first transfusion).

5-31-18—Hb. 40 per cent, R. B. C. 3,270,000, W. B. C. 12,000, Pmn. 43 per cent, S. M. 53 per cent, L. M. 4 per cent (before second transfusion).

6-2-18—Transfusion via sinus route; 200 Cc. injected.

6-3-18—Hb. 55 per cent, R. B. C. 9,800,000, W. B. C. 12,200; anisocytosis and poikilocytosis slight (after second transfusion).

6-29-18—Hb. 60 per cent, R. B. C. 3,910,000, W. B. C. 12,200, Pmn. 88 per cent, S. M. 12 per cent. Associate, Dr. A. I. Rubenstone.

G. H., 3 days. Referred by Dr. Charles Mazer. Hemorrhage of the new-born. Bleeding from all mucous outlets. Horse serum and other organic and inorganic coagulants gave no relief. Pale and moribund. Eighty Cc. of blood injected via sinus route and as much more under the skin, as the operator had raised a large hematoma at this stage and landmarks were destroyed. Infant appeared lifeless, save for its improved color. Heart action rapid but regular. Returned to bed. All bleeding ceased and did not recur. Hb. 20 per cent, R. B. C. 2,200,000, W. B. C. 10,000, Pmn. 60 per cent, S. M. 39 per cent, L. M. 1 per cent.

On discharge, 4-1-19, Hb. 80 per cent, R. B. C. 3,610,000, W. B. C. 8200, Pmn. 51 per cent, S. M. 48 per cent, L. M. 1 per cent.

Baby J. Referred by Dr. Rosenthal. 2-6-19—Eczema, anemia, edema. Hb. 30 per cent, R. B. C. 2,270,000, W. B. C. 8700. Transfused via sinus route twice; 250 Cc. injected each time. Latest blood examination showed Hb. 73 per cent, R. B. C. 4,370,000, W. B. C. 14,000. Present condition reported excellent in every way. Associate, Dr. A. I. Rubenstone.

C. B., aged 13 months. Extreme secondary anemia of unknown cause and spasmophilia. Referred by Dr. I. V. Levi. Transfused five times—four times via the sinus route and once via the median basilic vein. Her blood records follow:

Hb. 30 per cent, R.B.C. 2,400,000.

Hb. 45 per cent, R.B.C. 3,250,000.
Hb. 58 per cent, R.B.C. 3,400,000.
Hb. 36 per cent, R.B.C. 2,000,000.
Hb. 41 per cent, R.B.C. 2,000,000.
Hb. 53 per cent, R.B.C. 2,800,000.
Hb. 63 per cent, R.B.C. 2,000,000.
Hb. 78 per cent, R.B.C. 4,150,000.

In the beginning this child showed marked anisocytosis and poikilocytosis. She had pica and intense spasmophilia. It will be noted that she suffered several relapses. She always did better away from home under the kindly firmness of a patient and skilled trained nurse. It was difficult to get her to eat while under home influence. Away from home her appetite was always better. She is at present in health.

2011 CHESTNUT STREET.

RÉSUMÉ OF WORK DONE DURING THE SECTION-PERIOD OF SEPT. 23, 1918, AND MAY 31, 1919—A CLINICAL LECTURE AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.[1]

BY E. E. MONTGOMERY, M.D., LL.D., F.A.C.S.,
Professor Gynecology, Jefferson Medical College.

GENTLEMEN:—It has seemed to be a proper procedure and but fair to you that upon the completion of the session you should have a résumé of the work done. This paper will be confined to my own work, leaving my colleagues to make individual reports. The session-year began unfortunately, as we were no sooner started than the entire country was visited by one of the gravest epidemics known to history, through which all our plans were dissipated. Had we been rash and inconsiderate enough to undertake surgery, the exigencies of the epidemic demanded all the available room in our hospitals and our out-patient departments were empty. Work was limited to urgent cases, for it was impossible to exclude the probability of the surgical victim being possessed of germs which needed only extra irritation to fan into a flame.

The result of this unfortunate experience has been that two sections have had few cases for practical observation.

When I came to analyze the work, I found that of the 105 operative patients presented before the class or its various sections there had not been a fatality. I feared that such a report would cause you to regard lightly the gravity of such surgery, and have therefore included all the patients (public and private) on whom I have operated during the period from September 23, 1918, to May 31, 1919.

These operations comprise many of what are regarded as the most serious of surgery. Some of them came to operation after having undergone previous procedures of grave character, which were followed by extensive cicatrization and such distortion of the anatomy as to make it difficult to trace the ordinary landmarks.

In preparation for operation, we have made a departure from the previous habit of thorough purgation as a preliminary to abdominal and pelvic work and substituted an enema for the night and morning preceding the operation. This may seem scant preparation for grave procedures, but experience has shown that patients thus treated suffer less from tympanites and peritoneal disturbance than those who have had the more active preparation.

In all serious cases, the operations were promptly followed by continuous proctoclysis with salt or glucose solution and when deemed necessary by hypodermoclysis, or intravenous injections. The prompt replacement of fluids may mean the difference between success and failure.

The number of patients subjected to operation during this period was 170, of whom 105 were performed before the students in sections and the general clinics. Of this number six underwent repeated

[1]Delivered to the Senior students of Jefferson Medical College, and read before the Philadelphia Obstetrical Society.

operations. The operative procedures were as follows:

Vaginal and Vulvar:		
Curettement	83	
Amputation of cervix	31	
Perineorrhaphy	26	
Trachelorrhaphy	22	
Colporrhaphy, anterior	14	
Hysterectomy	12	
Colpotomy, posterior	8	
Splitting posterior lip of cervix	6	
Bartholin's gland excised	2	
Mucous polypi removed	2	
Vulva excised for cancer	1	
Incision and suture of ant. vag.	1	
Incision of imperforate hymen	1	
Adherent prepuce corrected	1	
		210
Abdominal:		
Appendectomy	78	
Shortening ligaments	42	
Hysterectomy, complete	9	
" supravaginal	17	
		26
Salpingo-oöphorectomy, one	14	
both	2	
		16
Salpingostomy	7	
Salpingectomy	6	
Resection of ovary	6	
Cystectomy, ovarian	12	
" broad lig.	1	
		13
Myomata, enucleated	7	
Intestinal suture	3	
" anastomosis	2	
Hysterotomy	2	
Oophorectomy	1	
Ventrosuspension	1	
Cholecystectomy	2	
		212
Obstetric:		
Normal labor	1	
Premature labor	1	
Cæsarian section	1	
Abortion, incomplete	1	
Removal of placenta	1	
		5
Miscellaneous:		
Paracentesis	6	
Abscesses, inguinal	1	
" ischiorectal	1	
" ventral	2	
		4
Abdominal incision	2	
Hemorrhoidectomy	2	
Resection of rectum	1	
Anal divulsion	1	
Herniotomy, inguinal	1	
" ventral	1	
Resection of bladder	1	
Inguinal glands enucleated	1	
Fatty tumor of cheek enucleated	1	
		21
		448

An average of 2.6 operative procedures for each patient.

In this list there were two deaths. The first of these underwent operation September 16, and consequently need not have been included in this list, had I been anxious to make a record. She was the wife of a physician and was seventy-five years old. Although married early in life she had never been pregnant. She came under observation with ascites and a mass on the left side which was quite firm and hard. It was not questioned that she was suffering from a malignant condition, but hoping that it might be relieved an incision was made, which disclosed carcinoma of the peritoneum, and the palpable tumor was the infiltrated and thickened omentum. Nodules were scattered throughout the peritoneum, making it worse than useless to put her in immediate peril by attempting to remove the omental mass. She was subjected to some six tappings to render life at all endurable for the year she survived. She died about three weeks after the last tapping.

The second case was a woman aged forty-six years, with the following history: She had been pregnant five times, four children delivered at term, and had been irregular in menstruation for several years, the periods lasting four to five days. For some months she had had a continuous discharge, attended with a bad odor, severe pain in the lower abdomen and back, and difficulty in defecation; urine sometimes bloody and causing frequent evacuation. She was quite fleshy, weighing 210 pounds, and very nervous. A tumor could be distinctly recognized extending above the umbilicus and filling the pelvis. The size and situation of the tumor made it evident that it was an interstitial fibroid, but the cervix presented conditions which made sure it had undergone carcinomatous change. All doubts of this were dispelled when we came to cleanse the vagina after administration of the anesthetic. Opening the abdomen disclosed that the entire growth was malignant. It so filled the pelvis as to make it difficult to proceed. It was only by pushing back the mass that the ligaments could be sufficiently relaxed to permit them to be ligated and cut. After ligating the superior portions of the broad ligaments and clamping the uterine arteries

lower down, I got my hand under the mass, and on raising it tore through the infiltration ring of the cervix and brought out the mass. The cervix was then dissected out, and with it the upper part of the vagina. The arteries were ligated and the venous oozing controlled by gauze pressure. The peritoneum was closed over the packing, which was removed by the vagina later. The wound was rapidly closed, but it was necessary to administer salt solution intravenously as the procedure was being completed. She rallied unexpectedly well, and her condition seemed very satisfactory for two days, when she displayed marked tympanites. In the afternoon of the third day I was called by an interne, who informed me that she was suffering from frequent vomiting. I directed him to institute lavage. He attempted it, but the patient died before he could succeed in introducing the tube.

There is no more effective way to relieve a patient with beginning peritonitis, as was this patient, than by the use of lavage, employing a solution of sodium bicarbonate (2 per cent), filling the stomach, siphoning it out, and repeating the procedure until the contents return clear. The distended stomach presses against the diaphragm, interferes with the heart's action and with the respiration. Oxidation is inefficient, the material decomposes in the gastrointestinal tract, and toxins form, which still further depress and imperil the patient's condition. I have seen such cases a few minutes subsequent to irrigation present an entirely different appearance and make the turn from a seriously grave condition to one in which you no longer have reason to fear the result. Occasionally, however, the surgeon will meet with the misfortune attending us in the case under consideration.

The number of operative procedures may seem out of proportion to the number of cases operated, but it seems to me that the surgeon should embrace the opportunity of an open abdomen to correct conditions which can be reached through it and use it to discover disorders of the upper abdomen. That this course is not sufficiently practiced is evident by the frequency with which we see women who have undergone operations for supposed appendicitis without relief of the previous discomfort, and the distress has been found due to a lesion of the uterine appendages.

The frequency with which appendectomy appears in this list may seem anomalous in a gynecologic clinic, but I do not feel that the operator has done his patient justice who opens the abdomen and leaves or overlooks conditions which may sooner or later prove a source of discomfort. Some years since I removed an ovarian cyst from a patient where it was extensively adherent, so that I did not think it wise to increase the traumatism or prolong the operation by the removal of the appendix; but before two weeks were passed I had to reopen the abdomen to remove a gangrenous appendix. I have since sought closer acquaintance with this organ in all abdominal procedures. Not unfrequently it will be found so embedded with adhesions from previous inflammation as to make its removal attended with difficulty, and these are the cases in which it would seem to be urgently demanded.

It has been my custom to begin the series of operative procedures, when they comprise or include repair or amputation of the cervix, methods for maintenance of displaced uteri, or the treatment of disorders of the appendages, and especially when the patient has uterine bleeding or profuse leucorrhea, with a curettement. This accounts for the frequency of the appearance of this procedure on our list of operations.

The infrequency of chronic metritis as indicated by the investigations of Hitschman and Adler, the inadequacy of the procedure in the control of hemorrhage and in overcoming dysmenorrhea, convince me that it is too frequently practiced, and I doubt the wisdom of its employment in a large number of this series. Any procedure which does not accomplish a definite purpose is superfluous and is better omitted, for it only extends the field to be guarded from infection. In some cases of acute anteflexion the employment of bougies will be necessary to

assist in straightening the canal. The following history is an example:

Miss —— of Pottsville, Pa., had some months previously to October 1, 1918, undergone an operation for pelvic inflammation without relief. She had a rather acutely anteflexed uterus, retroverted and fixed in the pelvis by extensive adhesions. In the preliminary dilatation and curettement it was necessary to split the posterior lip of the cervix to the posterior fornix before the dilator could reach the fundus. After curettement the posterior wound was subjected to the removal of a wedge-shaped section, and the vaginal and cervical flaps thus formed sutured to maintain the higher opening. The abdomen was opened, extensive and dense adhesions between the fundus and posterior surface of the uterus and adjacent intestines were separated, and the right ovary, which had been permitted to remain after the preceding operation, dissected out and anchored up. The fundus was sutured to the parietal peritoneum, carrying the latter over its posterior surface to cover the raw surfaces. In closing the abdomen the ugly scar from the previous operation was excised and the skin edges held in apposition by a mattress suture of catgut.

A cause for degenerative change and extensive adhesions in fibroids is found in a twisting of the uterus to better accommodate itself in the pelvis, by which the veins are obstructed and the tumor rapidly increases in size, and as its circulation becomes more obstructed adhesions are formed through which the circulation is maintained.

October 30, 1918, a colored woman underwent operation at the Jefferson before a section of the class for a tumor which was firmly fixed by adhesions. The omentum covered a fibroid tumor which extended above the umbilicus, and the uterus had rotated on its axis to accommodate another tumor in the anterior wall. The broad ligaments were clamped and cut and an incision made across the front which permitted an intraligamentary tumor to be enucleated. The cervix was cut across, the vessels ligated, and the peritoneum sutured over cervix and stumps of the broad ligaments; the appendix was dissected out of a distinct bed of adhesions.

On the 20th of November, 1918, another colored woman underwent operation for fibroids complicated with extensive inflammatory conditions. A median incision disclosed everything matted together with pus tubes on either side. It did not seem feasible to reach the cervix from either side or posteriorly, so a fibroid in the anterior wall was raised and an incision made transversely above the bladder and the latter pushed down, the cervix was cut across and pulled up, thus enucleating the growths and the pus tubes from below. The rectum had been invaded by the inflammation and its peritoneal and muscular coats injured in the separation. The vessels which had been clamped as the operation proceeded were ligated, the rectum sutured and the peritoneum sutured over the cervix and stumps, covering in all raw surfaces. An opening had been made into the vagina through which gauze had been carried and packed over the raw surfaces of the pelvis, and this excluded by the peritoneum covering the cervix and stumps.

The most trying cases which come to consideration are those which have been subjected to previous operation and are again obliged to be victims because of incomplete work or recurrence of disease. The following are interesting examples:

A colored woman had undergone in August, 1918, an operation for a large fibroid where supravaginal hysterectomy had been the procedure. She was subjected to reoperation February 18, 1919. She was suffering with intestinal obstruction, vomiting everything she ate, and had severe pain. A median incision disclosed collections of clotted blood which were walled off; the middle of the ileum was constructed by a band of adhesion which precluded passage of its contents. When the band was broken the collapsed portion of the intestine below could be seen filling. Large masses of new growth occupied the right deeper portion of the pelvis, the left ovary, and stump of

the uterus. A large handful of clot and loose tissue was removed from over the right kidney. The left ovary and surface of the stump was removed. The convalescence of this patient was rapid, but in a few months there was a recurrence of the disease, which has proved fatal.

A second case, that of a woman aged forty-eight years, who had undergone an abdominal operation in June, 1918, of a character unknown, except that the intestine was said to have been sutured in two places, had suffered for some time with symptoms of obstruction and a mass could be felt in the pelvis pressing on the rectum. A median incision permitted the discharge of a large quantity of ascitic fluid. The pelvis was found filled with a large mass of cancerous growth involving both ovaries, with growths over the bladder and at different points on the peritoneum. Infiltration of the omentum formed a considerable sized tumor. The fundus of the uterus contained fibroids. Both ovaries and the fundus were removed, and the peritoneum sutured over the cervix and raw surfaces. The intestines prior to the operation were greatly distended. The distention subsided after the operation, and the patient rapidly convalesced. Within three months subsequently there was a large ascitic accumulation, for which she had to be tapped. She survived the operation about nine months.

November 13, 1918, a woman, aged forty-eight years, came in suffering with continuous bleeding from the uterus with the history that she had undergone operation at one of our large city hospitals and supposed that her ovaries had been removed. The uterus was large, and extensive inflammatory conditions involved the pelvis. The abdomen was opened, and after separating adhesions it was found that the ovarian operation had evidently been limited to resection of the right ovary. She had a small fine band showing that ventrosuspension had been done, but was no longer exerting any influence. The fundus of the uterus, the left ovary and tube and the right tube were removed. I expected to find that the appendix had been removed, but it was behind the cecum, everywhere adherent, so that it had to be cut off at the base and the muscular and mucous coats pulled out of the peritoneal envelope.

Probably no class of cases are more discouraging in their results than some of the forms of tuberculous peritonitis. A young woman, aged twenty years, came to operation November 4, 1918. She had undergone an operation ten months previously for tuberculous appendicitis. The incision was made through the old scar, which was median; everything was adherent, and with the greatest difficulty the tubes were separated from coils of intestines. The left tube had drained into the sigmoid forming an opening half an inch in diameter. The right tube was also filled with pus and adherent to the rectum. Both appendages were removed, the opening in the bowel freshened and sutured. She had had a fecal fistula since her previous operation. This redeveloped, and a year later I again reopened the abdomen, resected the sigmoid, removed the fundus of the uterus, and secured what seemed a favorable condition for recovery. The fecal fistula has not reformed. She has incomplete recovery of the abdominal wall.

We have experienced great difficulty in preventing our wards becoming the dumping ground for abortion cases, criminal and otherwise. One of these was a girl fifteen years of age who had been seduced and an abortion attempted. She entered the hospital suffering from peritoneal infection. Her condition was such as to make operation seem imperative. The left tube separated from its adhesions contained purulent fluid which dripped from its open abdominal end. I wrapped it with gauze and milked it out by squeezing from the uterine end toward the abdominal. The right was found to contain a tubal pregnancy which the abortionist had not been able to reach. The entire tube was removed. The operation was done December 3, 1918. Two weeks later, the patient having had temperature and pain, with palpable evidence of an accumulation in the pelvis, I made a vaginal incision, using gauze drainage, and at the

end of a week she seemed to have fully recovered.

Another case of abortion underwent operation at the clinic, April 8, 1919, for infection. She had a number of fibroids in the uterus, and an abscess had formed in the right lateral wall of the uterus which had threatened to break through the anterior abdominal wall, and pus escaped as soon as the abdomen was opened. The fundus of the uterus was removed. In closing the wound the infected peritoneum was shut off from the peritoneal cavity, and drained by a stab wound.

I will close this paper by reciting the history of a rather unusual case. On the 28th of January, 1919, I presented to the class a young woman twenty-two years of age who had never menstruated, although having had the molimina for several years. She had a tumor which extended from the pubes to the xiphoid appendix, and the vulva bulged, showing an imperforate hymen. Under an anesthetic I made a free incision into the hymen, and there was a discharge of more than a gallon of viscid chocolate-like material. The complete evacuation of the fluid was promoted by pressure over the abdomen. Subsequently the uterus and vagina were packed with several yards of iodoform gauze. Her subsequent convalescence was undisturbed.

FORTY-NINE CASES OF ARTIFICIAL PNEUMOTHORAX.[1]

BY ROSWELL E. FLACK, M.D., ASHEVILLE, N. C.

The cases of artificial pneumothorax which form the basis of this communication were observed in the Winyah Sanatorium, where the method was first applied, by the late Dr. Silvio von Ruck in May, 1913.

The writer assisted in most of them, and since Dr. von Ruck's death in April, 1918, he has had charge of the application of this method himself.

The cases comprised in this series were all instances of advanced and progressive febrile phthisis, in which other methods of treatment had been unavailing or were not applicable, and with few exceptions the prognosis was unfavorable. Compression of the lung was resorted to as apparently the only method by which an arrestment of the progressive disease might still be accomplished.

In all the forty-nine cases the records are complete and the outcome is known.

We find that we obtained a complete arrestment and an apparent clinical recovery in seventeen, or 35 per cent of all cases, and that on discharge they were free from symptoms and that their general health had been restored. The time elapsed since their discharge varies between four months and six years, the average time being about three years. The time of their treatment averages fourteen months.

Our recent inquiry shows that fifteen of them have had no relapse and continue in good health; two patients have died, both from acute pneumonia after a short illness; one of them two years, the other one a year, after they were discharged from our care.

In one of the arrested cases we found marked pleural thickening on the side to be compressed, but nevertheless succeeded in obtaining a moderate degree of compression before a serous exudate developed, which formed slowly and without causing symptoms. The exudate reached to the level of the fifth interspace, where it remained stationary. The administration of gas was, however, continued with a view of maintaining the compression, and after two instances in its further administration there was a serous discharge from the site of the needle punctures. At first the discharge was copious, but gradually became very slight, and continued still at the time of the patient's discharge, at which time there had been no cough nor expectoration for several months, the cavity being apparently obliterated and the patient's general health

[1]Read before the Tri-State Medical Association (Virginia, North and South Carolina) at Charlotte, N. C., on Feb. 19, 1920.

entirely satisfactory. The level of the exudate had not changed.

In a recent communication the patient informs us that one of the sinuses has closed, but that there is still a very slight serous discharge from the other, situated about an inch lower.

The patient states that his health continues good, and that he has continued to follow his former occupation.

We can reasonably expect that, with further changes in the pleura and the absorption of the exudate, this sinus will likewise close. This experience corresponds, perhaps, to other cases in which gas escapes into the subcutaneous tissue through a needle puncture of a thickened costal pleura; the latter state and the non-resilient state of the tissue may readily account for the serous exudate escaping in like manner.

In twelve, or 24.5 per cent of all our cases, results were less favorable, but amounted nevertheless to marked improvement with amelioration of symptoms. Of the latter, the temperature had become normal, or nearly so, cough and expectoration were greatly diminished, and all had gained in weight and most of them were dismissed at their own request. In several others the improvement seemed to have reached a limit, and had shown no further advance toward a complete arrestment before we dismissed them.

Of these cases, six are now living, after an average of about two years since they left our care. Six others died, in five of which the opposite lung broke down; and in one empyema developed and caused the patient's death.

Of these improved cases, we can at least claim that the lung compression has caused decided amelioration of their condition with undoubted prolongation of life.

The remaining twenty cases failed to improve, although in most cases a fair degree of lung compression was accomplished, and temporarily we had hoped for better results. Of these, eighteen have died, and two are still living. The causes which appeared to stand in relation to our failure were in about half of them breaking down of the opposite lung. In several others intestinal tuberculous developed. One patient died of tuberculous meningitis; another of acute dilatation of the heart. In two patients inactive tuberculosis of the larynx became progressive. In three cases death resulted from acute bronchopneumonia.

Among these twenty failures were two instances of accidents, which are important to mention. One of the patients had received 600 Cc. of nitrogen gas without any apparent difficulty or discomfort. Nine days later 150 Cc. were given under normal fluctuation of the manometer and without complaint by the patient. Shortly afterward the patient's pulse became weak and frequent, the face cyanotic, there was cold perspiration, and left facial paralysis, and loss of vision. These symptoms disappeared completely in the course of an hour under stimulants and administration of oxygen.

The other accident proved serious and without adequate explanation, unless we accept as correct the cause of death to have been due to acute dilatation of the heart, this being the one given on the record of her case, which is as follows: "Normal fluctuation of the manometer during the administration of 250 Cc. of gas. Finished 6 P.M. No discomfort or pain. Twenty minutes later symptoms of dyspnea and cyanosis appeared and continued until death at 6:45. There were no other symptoms." Examination of heart and circulation during the continuance of symptoms justified the diagnosis of acute dilatation of the heart.

The forty-nine cases which we have considered are not all the cases in which a lung compression was attempted, but we need hardly detain you by enumerating this class of cases. In a number of them we were utterly defeated by degrees of obliteration of the pleural sac, which made it impossible to introduce any gas at all. We anticipated this in almost all of them from the results of physical examination and the records of previous pleurisy, while the patient was under our care or from which the patient had suffered before admission.

Nevertheless such a history does not necessarily preclude the possibility that a suc-

cessful compression may be accomplished, pleurisy at the base being the usual concomitant of excavation at the apex. It is particularly the fibroplastic exudate which tends to the obliteration of the greater part of the pleural sac. In almost all of our cases, more or less pleural adhesions were present and could, as a rule, be demonstrated with the fluoroscope. The cases in which an exudate develops during the course of gradual compression of the lung are, in our experience, without exception, instances of marked adhesions, and the case mentioned in connection with our results is one of this type.

In a number of such cases a satisfactory compression could not be accomplished, the introduced gas being limited to a hundred or two hundred cubic centimeters, which was apparently confined to a pocket beyond which we could not go; and further effort appeared useless. These trials appeared, however, justified and resulted in no harm.

In the so-called leaking pleura it is clear to us that gas, in the course of its early and continued administration, escapes. After the total administration of two or more thousand cubic centimeters of gas, in the course of a few weeks, no evidence of appreciable compression could be demonstrated by physical and fluoroscopic examination. We are of the opinion that, under the gas pressure, an adhesion attached to the lung surface separates or tears, opening some alveolar spaces, and the gas passes through the latter into the bronchi.

In this connection I wish to call attention to a method first employed by the late Dr. Silvio von Ruck, to show that the gas does actually escape from the pleural cavity, which may be designated as a hydrogen sulphide and lead acetate test. The apparatus required and the technique are at once simple and reliable. The apparatus consists of: A bottle; rubber stopper with two perforations; two pieces of glass tubing bent at right angles—one long and one short—the long one reaching almost to the bottom of the bottle; two pieces of rubber tubing—one piece of tubing to connect the bottle and manometer—the other, the gas needle and bottle; two pinch-cocks or clasps, to prevent the escape of hydrogen sulphide; white filter paper impregnated with lead acetate.

A fresh saturated solution of hydrogen sulphide should be used within a few hours after its preparation. After the manometer reading has been obtained, the hydrogen sulphide bottle is connected with the manometer and the gas needle with the bottle. The clasps are now loosed on either side of the bottle, the gas is turned on, passes through the H_2S solution and on into the pleural cavity. A piece of the lead acetate paper is moistened with water and held to the nose of the patient. If gas escapes from the pleural cavity, the lead acetate paper turns a black, or brownish-black, due to lead sulphide. This test is very delicate, and if there is any appreciable escape of gas it will be made manifest. In some cases the test gives a positive reading by the time 100 Cc. of gas are introduced. If after the introduction of 200 or 300 Cc. or more of gas the lead acetate paper still remains unchanged, we conclude there is no leak from the pleural cavity.

In all controls in whom we did not suspect any escape of gas from the pleural cavity, the test was negative. To control the work further, in cases that are apparently leaking, the fluoroscope may be used before and after filling. Immediately after a refill of 600 to 800 Cc. the fluoroscope shows temporarily a satisfactory compression, which can be confirmed by percussion and auscultation. The gas thus slowly disappears and the respiratory sounds return, showing that the gas was not introduced into the pulmonary tissue or a bronchus, and that it actually escaped from the pleural cavity, as confirmed by the test described.

In concluding we are firmly convinced of the value of lung compression, not only in cases of advanced febrile phthisis, in which the prognosis is otherwise entirely unfavorable, but also in subfebrile and afebrile cases in which the excavation is extensive or multiple in the same lung; or in which secreting cavities exist and do not heal out

by the employment of other methods, after a prolonged trial. In smaller destructive lesions we ourselves have not been obliged to resort to compression, as we usually succeed through specific stimulation with tubercle bacillus vaccine, which may sometimes be advantageously supplemented with intratracheal injections of a 3- to 5-per-cent solution of menthol in alboline, the latter being particularly valuable when other bacterial infections of the cavity are maintaining inflammatory changes and secretions of the cavity walls.

Within the last year or two we have recommended lung compression in all such cases just described after the tuberculous infiltrations of the opposite lung have disappeared or show distinct fibrous changes, which we accomplish with great uniformity by specific treatment. In cases so prepared there is little probability that the non-compressed lung will break down.

In many such instances we find by the time the opposite lung has sufficiently recovered to remove the fear of its breaking down, that the cavity is also undergoing cicatrization, and the sputum, if any remains, has become free from tubercle bacilli. Having accomplished this favorable result, there remains no longer further occasion for the consideration of artificial pneumothorax; and, in similar cases, we delay in resorting to it when the expectoration is steadily growing less, even though tubercle bacilli are still found. When, on the other hand, such a favorable course is not yet attained and we have no fear that softening and further excavation are liable to occur, we have recommended lung compression as a means of reducing the length of time necessary to effect the healing of the cavity, believing that the lung compression will enable us to accomplish our object sooner and with greater certainty.

This course has so far yielded us very gratifying results and will give us a much larger percentage of clinical recoveries in cases of lung compression than we have recorded above, when the method was only resorted to as a final endeavor to rescue otherwise hopeless cases.

CONTROL OF HEMORRHAGE IN THE NEW-BORN.

BERGHAUSEN, in the *Archives of Pediatrics* for December, 1919, states that when the hemorrhage is slight, pressure alone may suffice to control it, with or without the aid of a styptic, adrenalin, coagulose, thromboplastin, or coagulen, applied locally. When such simple measures are not sufficient, we are justified in using horse serum, whole human blood, or coagulose, thromboplastin, or coagulen, subcutaneously, in the hope of introducing the element needed to facilitate coagulation. When the hemorrhage is severe at the outset, or oozing persists and will not cease after employing one of the above simple measures, then we must resort to blood transfusion. This latter procedure is life-saving, and the experience of having saved a helpless exsanguinated infant from certain death is indeed a most happy one.

For the transfusion either whole or citrated blood may be used. His own experience is limited to the use of the father's or mother's blood, collected in 0.2-per-cent sodium citrate solution. Although reactions are likely to follow, an elevation of temperature approaching 100° to 102° F., with or without a chill, these quickly pass off and leave no deleterious after-effects. Since it is quite difficult to transfuse the young infant, the use of citrated blood simplifies the technique, for a slight delay will cause whole blood to clot. The success which has followed the use of citrated blood in the exsanguinated infant would speak for the use of citrated blood in all transfusions. Surely if the bleeding infant can withstand the slight reactions which follow, reactions which may occur in an adult when small amounts of human serum are given intravenously, then an adult suffering from some form of grave anemia can safely be transfused with citrated blood. At least his experience would tend to show that these reactions may be considered lightly, since grave complications never follow in the infant or in the adult.

Having collected about 200 Cc. of the parent's blood in a 0.2-per-cent sodium

citrate solution, the mixture is filtered through sterile gauze and kept at body temperature. The infant is placed upon the table and held firmly by a nurse. The peripheral veins are then examined. By making the proper pressure it may be possible to introduce a medium-sized needle into a vein of the arm, or into the external jugular vein. When the needle cannot be introduced successfully into a peripheral vein, then the blood can safely be introduced directly into the superior longitudinal sinus. He has injected as much as 100 to 150 Cc. of citrated blood into the sinus, using a 50-Cc. Luer all-glass syringe. The needle is introduced just to the left of the median line over the center of the "soft spot," and when blood drops from the needle the Luer syringe, filled with blood, is quickly attached. The injection is made slowly, the assistant watching the child carefully, noting any twitching of the face or cessation in breathing. If the face twitches or breathing becomes labored then the injection must be made more slowly, for these symptoms may possibly be due to sudden increase in the intracranial pressure. The syringe can be readily detached from the needle, when blood should again drop from the opening, before resuming the injection. The infant tends to move its head very freely and the nurse cannot always keep it quiet. At such times the needle may pierce the sinus wall and cause the blood to spread over the surface of the brain. He does not know that this has happened in the injection which he has made into the longitudinal sinus, but he does not fear its occurrence because the citrated blood, differing from whole blood in this respect, would not tend to clot and later cicatrize.

When the blood is introduced directly into the circulation the results are immediate, and only small amounts are necessary to stop the bleeding and to rescue the infant from certain death. We should aim to introduce as much as 100 to 150 Cc. of the blood into the circulation, but when this is impossible smaller amounts will be found sufficient to control the hemorrhage. He is in the habit of making subcutaneous injections of the citrated blood in addition to the intravenous injections. This blood is slowly absorbed, acts as food, and tends to prevent recurrence of the bleeding.

ABANDONING THE OLD REMEDIES—"WATCH YOUR STEP."

In an editorial with the above title, the *Indianapolis Medical Journal* for January, 1920, states that aconite, hyoscyamus, aloes, asafetida, veratrum viride, colchicum, lobelia, blood-letting, and many other agents have met with a revival. For a period they were lost. Some persons were called old fogies because they prescribed them. The new and untried remedies came with a rush and the potent agents were forgotten. No doubt it was for this reason that many doctors were unsuccessful in the treatment of their patients. It was the new generation that called attention to the usefulness of many of the older remedies, and it is strange that they were abandoned even for a short time.

A modern practitioner is not one who abandons the remedies of value for the flashlights of uncertainty, nor does he belong to the visionary class who often meet failure.

What is the condition of the patient who has undergone experimentation? It is always unwise to set aside good therapeutic agents until the new ones are shown to be better. A few case reports will not suffice. There must be positive evidence, and until such is produced a patient should not be the subject of experimentation when there are old and tried remedies that are capable of curing the disease.

There are men who deserve censure for their attitude in therapeutics which has resulted in failure from the use of unreliable remedies which were heralded as something new like a house standing on the sand. But perhaps the manufacturer made a vast sum of money and some detail man had hypnotized the doctor. "It is never pleasant," says an author, "to back water and eat crow," but this sometimes becomes the diet of the man who rushes after strange gods.

EDITORIAL.

THE INTRAVENOUS TREATMENT OF MALARIAL INFECTION.

Our readers will remember that we have dealt with this subject repeatedly during the last three years in Leading Articles. The sum and substance of the matter at present seems to be that the administration of quinine by the mouth in severe malarial infection is very often inadequate, and that in many cases the only efficient method of treatment is by intravenous injection. If the patient has parasites which have become immune to quinine through the use of comparatively small doses by the mouth, the intravenous use of arsphenamine may be resorted to, and it will be recalled that in 1917 Rogers suggested and employed antimony by intravenous injection for the purpose of causing the disappearance of the crescent form from the blood. It is true that subsequent to this report other clinicians failed to get the results which he expected, but we note with interest that in the *Journal of the Royal Army Medical Corps* Patrick has a long report upon the intravenous injection of antimony in the treatment of malaria and believes that antimony has a strong claim to a thorough trial. Patrick insists upon the point that though quinine, when given by the mouth, may arrest the development of periodical attacks it does not in many instances eradicate the parasite. Because he found this constantly true he decided to try the effect of both quinine bihydrochloride and antimony tartrate intravenously, using 15 grains of the former and about 2 grains of the latter on eight successive days. In some instances three doses of quinine were given first and then five of antimony. In others the quinine was given on the second, fourth, and sixth days and the antimony on the others. But it is noteworthy that on the days on which the antimony was injected 30 grains of quinine sulphate were given by the mouth.

From the standpoint of scientific accuracy, therefore, the question may be raised as to how efficient the antimony was in producing results. Doubtless there are those who will assert that it did little good and that the improvement depended upon the free use of the quinine. Patrick recognizes that so far as scientific accuracy is concerned the two drugs should be used in parallel series of cases. This, however, was not found to be feasible. He is, however, firmly convinced of the fact that quinine, even in simple tertiary malaria, is unsatisfactory for the eradication of the disease, although it may diminish the symptoms for a time. He urges those who have the opportunity to determine if his results with antimony are sufficiently reliable to make it one of the standard forms of treatment.

The quinine bihydrochloride was given in one of two ways: either diluted 300 times and injected by means of a filter funnel attached to rubber tubing and a rather large needle, such as is used for the injection of arsphenamine, or in a more concentrated solution by means of a syringe with a finer needle. The dilute solutions have been recommended on the ground that the strong ones cause venous thrombosis, but this has not been Patrick's experience, and he believes that the syringe is much to be preferred. There is less danger of a chill due to the water not being pure as it might be through recent distillation, and while he admits that temporary discomfort may be caused the patient by the strong solution he believes that it is otherwise harmless. The syringe that he employs is a 20-Cc. Record syringe, and the finest available needle is used because such a needle causes less pain, can be more readily introduced into a small vein, and necessitates a slow injection. He sterilizes the syringe by placing it for an hour in a glass jar containing 5-per-cent lysol solution with a little cotton-wool in the bottom. The syringe of course is taken apart before this disinfection is carried out. Before using

the syringe it is washed with sterile cool water to be sure that all lysol is removed. He does not recommend boiling these syringes. The needles are of course sterilized separately by boiling. A fresh needle should be used for each patient when a series of patients are injected within a short time. The quinine solution which he employs is the 5-per-cent solution of the bihydrochloride made up into distilled water with 0.8 per cent of sodium chloride added. It is necessary, of course, to carry out the strictest antiseptic precautions in regard to this quinine solution. He attains this result by boiling it in a beaker and storing it in sterile bottles, which can then be resterilized in an autoclave, or if necessary in a large covered saucepan. The antimony for injection is made up as a 1- or 2-per-cent solution of the tartrate in a 0.85 salt solution, carefully sterilized and put up in a bottle with a rubber cap as vaccine is put up. A 0.3-per-cent solution of carbolic acid may be added to keep it sterile. A vein in the arm is used, with sterilization by iodine, for injection.

Patrick admits that the strong quinine solution may within twenty seconds produce a feeling of uneasiness in the chest and deepening of the respirations, followed by a sensation as if something were rushing inside the head, or a sense of warmth spreading over the body. A bitter taste may appear in the mouth, but all these symptoms he claims disappear within a few minutes. He admits that he has seen cases in which hemoglobinuria developed in chronic malarial patients from these injections, and he also speaks of patients having an idiosyncrasy to quinine, and in these the antimony would seem to be the remedy of choice. If the antimony tends to induce nausea and vomiting, the dose should not be greater than one grain.

To sum up Patrick's conclusions he finds that in 104 patients with chronic relapsing tertiary malaria treated with three injections of quinine bihydrochloride and five of antimony tartrate, 55 per cent remained free from an attack for three months or longer. He believes that even intravenous injections of quinine may not have much effect in preventing relapses, and feels sure that the antimony tartrate is the effective factor along this line; in other words, that the quinine checks the attacks and the antimony acts by destroying the parasite.

INFLUENCE OF ALCOHOL AND NICOTINE UPON THE OVARY.

In times past we have discussed in the pages of the GAZETTE various studies which have been made upon animals, and sometimes upon man, in regard to the effect of alcohol upon offspring and especially upon prenatal development. All of these studies have a certain amount of value, although some of them have been materially impaired in their usefulness by the large quantity of alcohol which has been employed or by the peculiar susceptibility of the animals used. Again they have been impaired in usefulness by the experimenter reaching conclusions which his observations did not justify.

Many difficulties surround the study of the action of drugs upon the development of the human embryo and animal. In some instances the animals are kept under conditions which result in so much confinement and variation from normal life that it is difficult to determine how much the drug and how much other influences have produced results. In human beings the persons experimented with have usually not been perfectly normal, but belong to a class that could be experimented with in one sense; in other words, a class that is primarily defective. For all of these reasons conclusions which are arrived at by experiments on animals when applied to man must be received with much caution.

In this connection a paper published by Ogata in the *Journal of Medical Research* is of some interest, although he wisely is cautious in the deductions which he reaches. He used both alcohol and nicotine. Concerning alcohol, he quotes Simmonds as having found atrophy in 60 per cent of testicles of adult males examined at autopsy, whereas Cordez observed no atro-

phy at autopsy. He also quotes Ivanow as having investigated the effect of alcohol upon spermatozoa. He found that the direct influence of alcohol was much less than the indirect influence when the drug was introduced into the body. In all the experiments the question arises as to whether the quantity of alcohol used was far in excess, per kilogramme of weight, of what is ordinarily taken by human beings.

Ogata finding little literature dealing with the effect of alcohol and nicotine upon the ovary started an investigation of his own. He states that Arlitt and Wells investigated the ovaries of alcoholized rats and found them atrophied or poor in ova, but drew no definite conclusions. In Ogata's experiments he used young rabbits, but took some that were sexually fully developed. He also used control animals that did not receive alcohol or nicotine. So far as alcohol was concerned he found no noteworthy changes macroscopically, although it seemed that the ovaries weighed a little less than normal in the alcoholized animals. To sum it up briefly he did not find any apparent changes in the ovaries when repeated alcohol injections were made into the ear vein even if the ovary was examined with the microscope.

The results which he obtained with nicotine also revealed no particular changes, there being no apparent reduction in the number of developed Graafian follicles nor in the stroma of the ovary. Ogata concludes that chronic alcoholism of parents has a great influence upon their descendants chiefly through the effect on spermatozoa, and that nicotine has no apparent influence upon the ovary or upon descendants.

The great point to be remembered in all such experiments is that the descendants of alcoholics are the descendants of persons who are primarily abnormal before they began abusing alcohol, and therefore the question arises as to how much of the deterioration which may appear would have been present if alcohol had never been touched and how much of it is definitely due to this drug.

CALCIUM CHLORIDE AS A HEMOSTATIC.

When Wright and Paramour, and other workers, published papers some years ago expressing the view that certain cases of persistent hemorrhage were due to a lack of calcium salts in the blood, the profession, partly because it had as yet no adequate remedy and partly because of the prominence of the authors, received their proposition with enthusiasm. It was not long, however, before it was found that in the great majority of instances the use of the calcium salts in the form of the chloride or the lactate was practically useless. It also became clear that if they were pushed too freely, or over too long a time, they tended to diminish the coagulability of the blood rather than to increase it.

Not long since we pointed out in these columns that the work of Mohler and others indicated very strongly that the small quantities of calcium chloride which the blood must have to be in normal condition can always be obtained by the blood from the calcium salts which are stored in the bones. Nevertheless now and again we read of the employment of these salts to check profuse hemorrhage or oozing hemorrhages. If the writer's recollection is correct it is that Wright and his colleagues never recommended these salts for profuse hemorrhage, as in hemorrhage from the lungs or from the uterus, but only in that type of case in which there was prolongation of coagulation time, as, for example, in certain cases of jaundice.

Our attention is more particularly called to this matter by a report of a case made to the *British Medical Journal* of November 8, 1919, in which a man of twenty-five, having to be operated on for a diseased tonsil, refused local or general anesthesia and the tonsil was removed by a spade guillotine, with little hemorrhage, the patient being allowed to walk away a few minutes afterwards. An hour later, however, the physician was called and found the patient blanched and bleeding very freely. The bleeding seemed to be venous, and as pres-

sure failed to stop it a 1:4 solution of calcium chloride was injected into both buttocks, the total amount being 8 to 10 grains. The reporter of this case asserts that the effect was striking; the bleeding ceased in a minute and a half and did not recur, except that a week afterwards there was slight venous oozing, but ceased when the calcium chloride injections were repeated.

We confess that we cannot help feeling that this is an example of therapeutic optimism. To suppose that anything given hypodermically can arrest hemorrhage in a minute and a half is quite beyond our conception of the results of subcutaneous or intramuscular injection, and the idea that calcium chloride could have entered the blood stream in that time and had any effect in hurrying coagulation is beyond belief.

Incidentally we may point out that such an injection of calcium chloride is exceedingly irritating and sure to produce a slough, so that we would warn our readers against attempting its use in this manner. If a calcium salt is given hypodermically it should be calcium lactate, and it should be diluted to a point which makes it non-irritating.

VARICOCELE.

This term, recognized as meaning dilatation and elongation of the veins of the pampiniform plexus, since the beginning of medical knowledge has been the lever on which those few obsessed by neurasthenic symptoms, particularly such as have reference to the genital functions, have been worked to their own disadvantage and the financial profit of charlatans. There have been periods of enthusiasm, waves of fashion, which have carried in their sweep even those physicians and surgeons who are both wise and ethical. During such periods operations for varicocele have become advocated and widely practiced.

Because of the unsatisfactory, at times unfortunate, results often following such operations these periods of activity have been followed by ones of reaction on the part of the real profession in which conservation has been dominant.

It must be remembered that varicocele has long been regarded as an adequate reason for rejection of applicants for military service. Perhaps the most potent argument against this universal rule was advanced by Bloodgood, who, as the result of following the after-course of a number of cases, found that many of those not operated upon were perfectly capable of doing hard work and suffered no ill consequence, that some, indeed many, of those operated upon, were left in a more crippled condition than before. He advocated the abolition of the flat rule of varicocele as a cause of rejection and advised, rather, that a man complaining of no symptoms and exhibiting this condition should be accepted. This was done, in consequence of which the army and navy have been able to contribute some further knowledge bearing upon the question of disability and treatment.

Thus Reed (*Military Surgeon*, December, 1919) notes that many men apparently perfect have found that they were unable to perform full duty because of varicocele, which prior to enlistment had occasioned no notice.

He gives three general classifications of cases of varicocele:

1. The patient presenting a varicocele which produces no psychic or reflex disturbances and annoys him only because of the weight and size of the scrotum and the traction upon the cord. This type of individual is easily handled. He complains of physical discomfort only and usually states that he has tried scrotal suspension and discarded it because of mechanical irritation. Rather pronounced elongation and dilatation of the veins is the rule, and the subjective symptoms can readily be explained by the existing pathology. When advised that he can be relieved by operation he submits, and convalesces to complete recovery without subsequent thought of his previous condition.

2. The patient with a small or medium-sized varicocele who has developed a neurosis the chief feature of which is fear of

genital defect associated with a great variety of aches and pains, all out of proportion to the objective findings. It is certainly reasonable to suppose the physical defect in itself cannot account for the symptomatology in the otherwise normal individual. Marked modesty is usually displayed by this type of patient when he is examined, and he complains of great tenderness of the testis and cord when it is manipulated with the examining fingers. In most instances the scrotum is not so relaxed as in the more marked type. Much anxiety is entertained as to the present condition of the testicle and what will happen to it if the varicocele is operated. Frequently he will request transfer back to duty, stating that the affected side has ceased to trouble him. If this request be granted, he will promptly return in a few days with the same complaint as before. This man deserves serious consideration if he is to be saved from developing into a pronounced sexual neurotic. Careful questioning before physical examination as to how his varicocele bothers him, how long he has noticed its presence, whether he understands just what it is and how it is produced, will very often reveal that he believes the veins to be intimately connected with the testicle and capable of affecting his generative powers. At times he will state that he is afraid an operation will cause damage to the organ. It is well here to explain the nature of a varicocele and the mechanical factors entering into the operative procedure for its relief. The more important anatomical relations should be explained in order to impress upon him that once operated he is sure of relief. It is a great satisfaction for this type to learn that no general anesthetic is needed and that the operation is not performed within the scrotum. Only when the patient fully understands his condition and the principle of its correction will he experience any benefit after being submitted to operation.

3. This patient has at most a medium-sized varicocele which never has produced any symptomatology or inconvenience, and probably never will so long as it remains untouched by operation.

It would seem advisable to allow such a man (type 3) to continue until such time as varicocele may give rise to sufficient distress to require relief by operation. Observation has revealed that certain of these individuals will develop, if operated, a sexual neurosis characterized by a great variety of subjective symptoms which increase with time and are frequently used as a plan for excuse from full duty.

Local anesthesia is the method of choice, and the non-toxic preparations made up in 0.25-per-cent solutions work satisfactorily. The external ring is determined by palpation, and the skin injection started a little below and extended upward over the canal parallel to Poupart's ligament for a distance of about three inches. After incision of the skin and superficial fascia all small points which persist in bleeding are caught and ligated with fine catgut, thus insuring a dry field and obviating the presence of instruments, the drag of which tends to produce pain. Retraction of the edges of the incision will reveal the external ring and the aponeurosis of the external oblique. The size of the ring, its laxity, and the ease with which the cord can be delivered will determine whether the margins shall be injected and cut or not. Grasping gently the sheath of the cord, a small amount of the solution is injected and the incision made longitudinally. The veins are next lifted out and the sheath stripped downward with a blunt instrument. Usually the vas and artery of the cord will remain with the sheath, but they should always be identified by sight and touch. That portion of the veins to be removed is crushed at both ends with a hemostat, ligated, and excised. One of the ligatures is now threaded upon a needle, and the stumps are transfixed with one or two stitches, after which they are again tied and returned to the sheath. The external ring is repaired if cut and the fascia and skin closed in the usual manner.

CANCER AND PROLONGATION OF HUMAN LIFE.

By even the casual reader of mortality statistics it will be noted that the toll of cancer deaths is a large and steadily growing one: that this as the cause of crippling and death bids fair to make even tuberculosis take a secondary place; and that wider knowledge and earlier diagnosis and prompter treatment have not as yet produced a marked influence upon the incidence of the disease in so far as may be judged by the fatal, which are the only reported cases.

W. J. Mayo (*Surgery, Gynecology and Obstetrics,* January, 1920), writing under the caption which heads this article, states that since the close of the Civil War fifteen years have been added to the average length of human life, and that with present knowledge and present conditions, fifteen years more might be added to the life of man in this country within the next twenty years. He holds that ten years will be added to the most productive age from the standpoint of industry. As a principal factor he regards the general introduction of pure water, which makes its practically universal use as a beverage not only desirable, but safe.

It is particularly in regard to the elimination of cancer his paper is most strongly centered. He observes that one woman in eleven and one man in thirteen die of cancer, and that this proportion will be maintained in an enormously greater number of persons who reach the cancer age. One means of preventing this is the universal appreciation of the fact that chronic irritation is the great underlying cause of the disease. Good dentistry has eliminated a percentage of cancers of the jaw due to irritation of defective teeth. Cancer of the lip and tongue is on the increase as the habit of smoking is on the increase in both sexes. Cancer of the breast seems to be in direct ratio to the amount of covering on the breast and the pressure exerted on it. In countries in which the breasts are allowed to remain exposed to the air without covering, breast cancer is extremely rare.

Thiry per cent of all cancers in men and 21 per cent in women are in the stomach. The drinking of hot fluids is regarded as a favoring factor. The attack against the large incidence of cancer lies first in removing causes—*i.e.,* the avoidance of all sources of continued or repeated local irritation; second, in early diagnosis. He emphasizes the need of early recognition of both the actually cancerous and precancerous conditions and the remedying of them; a complete and promptly performed operation and precautions taken to avoid implantation of cancer cells by either rough handling or too close dissection with the knife. If this danger is imminent the cautery is always preferred. It is held that radioactive substances give greater promise for the future. Mayo would include with the radium and the *x*-ray the radiant energy of heat. Radium and *x*-ray are more or less selective in their action. Masses and bands of scar tissue are produced which delay the advance of the gowth, but make subsequent late operation difficult and often ineffective. Heat is not selective, and the scar tissue resulting, while ineffective in preventing progress of the cancer, does not interfere so seriously with late secondary operative procedures. Radiotherapy has justly achieved a reputation in the postoperative treatment of cancer, but would appear to have its greatest field of usefulness in preparing a malignant area against wound grafting during operation and its ability at least temporarily to reduce the vitality of the malignant cell.

Operations should not be delayed after radiotherapy since the period of increased cell vulnerability is short and the connective-tissue development which interferes with subsequent operation is rapid. By properly combining radiotherapy with surgery, we can increase operability, lower mortality, and increase the percentage of cures. Concerning cancer research Mayo holds that there is a measure of immunity against cancer in all persons. He has on

several occasions been unable to remove all the cancerous growth, yet the patient has remained well for a term of years. A search for the cause of immunity is greatly to be desired. The surgery of the past has been concerned largely with gross pathological conditions. The preesnt surgery strives by every means within its power to reach those conditions before they become gross. It is to be hoped that the time will come when treatment may be intelligently applied so early in the stage of differentiation from the normal that gross surgery will be unnecessary. The physicists are quoted to the effect that colloid represents energy in life as radium represents energy in matter, and that the physical side of matter may influence these early stages which may result in cancer. The benign cystoid appendix, the escape of its colloidal contents from an aperture in the wall of the appendix into the peritoneal cavity, resulting in grafting of hypoblastic elements upon the peritoneum—pseudomyxomatous peritonitis, myxomatous peritonitis, colloid peritonitis, and eventually cancer—are a series of steps which are rather common examples of those processes which are related to the colloidal state. It might be assumed perhaps that the physical activity of colloidal particles attacks the tissues and prepares the field for grafting. Again it may change the nature of the disturbed mucous cells in the cystic contents of the appendix and thereby set in motion a series of events which result in cancer. Such changes are often seen in the ovary and not infrequently in the mucous surfaces of the large intestine and rectum or any part of the body. It is towards biochemistry that Mayo points as likely that research will throw light upon cancer, indeed if not all the phenomena of life.

The cancer researches conducted by bacteriologists collaborating with white mice, rabbits, and other animals, though yielding an enormous amount of printed matter, have brought to the professional man little which can help him in his struggle against this curse.

REPORTS ON THERAPEUTIC PROGRESS.

TREATMENT OF GOITRE WITH INJECTIONS OF PHENOL, TINCTURE OF IODINE, AND GLYCERIN.

SHEEHAN and NEWCOMB, in the *Journal of the American Medical Association* of January 10, 1920, advise that five drops of equal parts of tincture of iodine, chemically pure phenol, and glycerin be injected into the most prominent part of the gland. The needle is plunged directly into the substance of the gland, and the patient is told to swallow. If the needle is in the gland, it will have a wide upward and downward movement during the act. If the needle is extraglandular, no such excursion of the needle will take place. Care should be taken to inject the material very slowly, as hasty injection causes great pain, which may be referred to the ears. At other times it will be referred to the jaw and sides of the neck. There is always some pain, which takes place after the fluid has been injected; but this subsides within a short time. If too much of the material is injected, alarming symptoms of acute strumitis may set in. Some patients feel weak; others may actually faint. The interval of treatment is generally five days, but the frequency of the injections will be in direct ratio to the reaction. Some may accept treatment every three or four days, others between the fifth and seventh day. It is never safe to inject more than 12 drops. After the fifth injection one can readily determine the progress of the case. In some cases five injections suffice; in others many more may be needed. In one case of the series of fifty-five, as many as twenty-six injections were given before a cure was effected.

They conclude: (1) A goodly percentage

of parenchymatous goitres will be cured by this method. (2) It relieves the thyrotoxicosis in the graver forms. (3) It is of no use in the cystic and colloid forms, and never should be given. (4) It is a safe procedure if one's technique is not faulty. (5) It is given as a preliminary in all cases going to operation, with the exception of the cystic, colloid, and cancerous forms. (6) It is the only hope of relief in the inoperable cases and those in which surgery is refused.

AN EXPERIENCE WITH THE SCHICK TEST AND TOXIN-ANTITOXIN, AND A PLEA FOR THEIR USE IN THE EXTINCTION OF DIPHTHERIA.

LILLY, in the *Boston Medical and Surgical Journal* of January 29, 1920, states that from his experience he has drawn the following conclusions:

That in institutions, schools, or communities where diphtheria has been prevalent for a considerable period of time, the universal taking of cultures, excepting in clinical cases of sore throat, is practically useless.

That a non-virulent bacillus is often found to be persistent in the throats of so-called chronic diphtheria carriers.

That repeated passive immunization with diphtheria antitoxin does not protect families, schools, or institutions, and that such immunization lasts less than three weeks.

That immunity to diphtheria is both absolute and comparative.

That toxin-antitoxin *does* give absolute immunity to diphtheria when more than one month has elapsed after its administration, and that it causes no such troublesome and alarming reaction as antitoxin often does, and that the immunity persists indefinitely.

That toxin-antitoxin has no curative properties and does not immediately protect against diphtheria. In clinical cases large doses of antitoxin should be used instead of toxin-antitoxin for both patients and contacts.

That the Schick test is not rapid enough to be of immediate use in cases exposed to clinical diphtheria, and should be used only to separate immunes from non-immunes.

That the Schick test and active immunization should be used in schools, camps, institutions and communities where diphtheria persists and where there is no immediate demand to protect life.

His four years' experience with the use of toxin-antitoxin in the prevention of diphtheria, during which time he has immunized more than one thousand persons, every one of whom, when available, has been given the Schick test after periods varying from three months to three years from their initial dose of toxin-antitoxin, and practically all of whom, especially after the longer periods, give a negative Schick reaction, has made him optimistic enough to hope that in this method we have a means of exterminating diphtheria.

We all know that smallpox is almost a medical curiosity through the persistent use of vaccination.

We know that typhoid fever in communities under proper health supervision is of unusual occurrence, and that by the use of typhoid prophylactic treatment has been practically driven out of our army and navy.

THE APPLICATION OF PURE COCAINE FOR NASAL ANESTHESIA.

ANDREWS, in the *Illinois Medical Journal* for January, 1920, states it is not the purpose of his paper to go into the details of local anesthesia, but to compare the use of pure powdered or flake cocaine with the cocaine solutions ordinarily employed.

Nearly twenty years ago his attention was first called to the subject by an article by Freer. In the light of some unfortunate experiences with the use of two- to four-per-cent solutions it then seemed that powdered cocaine applied to the nasal mucous membranes would be decidedly dangerous, but after talking with some of his friends who had tried the plan, and being assured that their experience indicated that it was as safe as other methods, he began cautiously to apply powdered cocaine directly to the nasal mucous membrane. The results were so satisfactory

that he soon abandoned the use of solutions, and for the past more than a dozen years has kept no cocaine solutions in his office.

The method which he has adopted is as follows: First, apply to the part to be anesthetized pencils of cotton saturated with one-to-five-thousand solution of adrenalin. These pencils should be left in position five to eight minutes. After their removal a small pledget of cotton is wound on an applicator and dipped in water or adrenalin solution. The excess of fluid is removed from the pledget by touching it to a towel. The damp pledget is then dipped into the powdered or flake cocaine and a small amount of the cocaine is rubbed gently over the desired area. Removal of the excess of fluid from the pledget is important, for if the pledget is too wet the fluid will run off into the remaining dry cocaine and cause it to crystallize. If profound anesthesia is to be produced a second application can be made after two or three minutes. Ordinarily anesthesia is sufficient for examination or operation to be commenced immediately after the second application.

The advantages claimed for the method are:

1. It is safer than cocaine solutions. The contracting effect of the cocaine powder upon the blood-vessels seems to prevent its absorption. In several thousand anesthesias produced by this method he has yet to see his first case of appreciable constitutional disturbance.

2. The anesthesia is more prompt, more profound, and more lasting. If carefully applied the ordinary operations become painless. The one notable exception is that of opening the antrum of Highmore. Cocaine applied to the nasal side of the antral wall does not anesthetize the antral mucous membrane.

3. The small amount of cocaine required is advantageous both from the standpoint of safety and economy. From one-fourth to one-half grain of flake cocaine is sufficient to anesthetize both sides of the septum for a submucous resection. If strong solutions and saturated pencils are used, several grains will be required.

RESULT OF TREATMENT OF NEUROSYPHILIS (GENERAL PARESIS AND CEREBROSPINAL SYPHILIS).

SOLOMON, in the *Boston Medical and Surgical Journal* of January 15, 1920, gives a review of four years or more after the dismissal from the hospital of ten cases of neurosyphilis which were reported as aided by antisyphilitic treatment. Nine of these were committed as insane; the remaining case was diagnosed as general paralysis, but not necessarily committable. Eight cases were diagnosed general paralysis, two as cerebrospinal syphilis. It should be added that the diagnosis of cerebrospinal syphilis was changed from general paralysis in one of these two only because he cleared up under antispecific treatment. The mental symptoms were those of paresis. Of the eight cases diagnosed general paralysis, five are now living at home. Three are apparently entirely well; two, while not well, are able to care for themselves and live a normal life in the community. Two are dead and one is in a hospital. One of the two which died had a fair remission with economic efficiency for eighteen months, and had all laboratory reactions negative at one time. The one which was in a hospital had a remission of three years' duration. Two cases were diagnosed cerebrospinal syphilis (non-paretic), but with marked mental symptoms. One left hospital apparently entirely normal and with negative laboratory signs; he has been lost from view. The other is now serologically negative and mentally normal after four years.

Of eight cases diagnosed general paralysis, three are apparently entirely well after four years; two are well enough to live outside and care for themselves; one had remission of more than three years' duration, now in hospital; two are dead, having had remissions of eighteen months each.

Of two cases diagnosed cerebrospinal syphilis with mental symptoms, one is lost from observation, the other is mentally normal and serologically negative.

This report leads the author to feel that it is possible to help a portion of cases of

general paralysis or cerebrospinal syphilis with mental symptoms, and that intensive, systematic treatment will change the prognosis of general paralysis. It was not the intention to discuss the percentage of cases of general paralysis that could be helped when the report was first made in 1916, but it did represent a fair percentage of the cases that had had intensive treatment. At this time the desire is merely to bring this report up to date. It does seem encouraging, however, that the results have been so good for such a relatively long period. Solomon concludes that the majority of cases of syphilis of the nervous system, whether the so-called cerebrospinal syphilis, tabes dorsalis, general paralysis, or other forms, are entitled to treatment, and if this is done thoroughly, intensively, and systematically, the results will be gratifying. The form of treatment consists in mercury, iodides, arsenic by intraspinous and intracranial injections, and the amounts will necessarily depend upon the condition of each individual patient.

THE TREATMENT OF PERNICIOUS ANEMIA.

HAMMAN, in the *New York State Journal of Medicine* for December, 1919, states that the methods are chiefly five:

1. A hygienic-dietetic regimen.
2. The use of arsenic.
3. The eradication of foci of infection.
4. Transfusion.
5. Splenectomy.

1. The hygienic-dietetic regimen consists of absolute rest and a liberal diet. That the rest may be complete and the diet abundant a whole host of accessory measures are used. These include the special nurse, social isolation, enforced eating, massage, baths, stomachics, etc. Since achylia gastrica is a constant symptom nearly all physicians administer hydrochloric acid to improve digestion. Mosenthal has emphasized a plan of overfeeding which seems to be of benefit if the patient can eat the required amount of food.

2. Arsenic is the time-honored drug used in pernicious anemia. Formerly it was given by mouth; it is now the common practice to give it intramuscularly; it is often administered intravenously. In individual cases one method may have advantages over another, but there is no reason to believe that fundamentally their action is different. In most instances administration by mouth is as efficacious as other methods of administration. Arsenic certainly has no specific influence in pernicious anemia, but it does seem to influence the patient's condition and promote or hasten remissions. However, some clinicians express a doubt of it having any influence whatsoever.

3. That pernicious anemia is due to some focus of infection or that foci of infection at least exercise a baneful influence in pernicious anemia is now a popular view. Such foci are diligently sought for, and when found summarily eradicated, if eradication be possible. Infected teeth are removed, tonsils excised, sinuses opened, gall-bladders drained, etc. Unquestionably patients often show remarkable improvement after such operations. But we are quite unable to say whether the benefit is due to the removal of an influence acting directly upon the disease, to improvement in the general condition of the patient, or to improved digestion.

4. Transfusion has now become the most important and certainly the most popular method of treating pernicious anemia. Hamman does not review the technique of the operation nor the various methods employed. At the Johns Hopkins Hospital the citrate method has been used almost exclusively and with complete satisfaction. Views differ about the proper time to employ transfusion and whether repeated small or fewer large transfusions should be given. The results aimed at are to tide a patient over a critical period until an altered adjustment between blood formation and blood destruction may inaugurate a spontaneous remission or else directly to force such a readjustment and thus provoke a remission. The immediate effect of blood transfusion upon the blood picture has been

studied in a group of cases in the wards of the Johns Hopkins Hospital by Huck. His studies show that these effects cannot be explained simply as the mechanical result of adding a stated quantity of blood to the circulation. The immediate rise in the number of red cells in some patients, for instance from 480,000 to 1,300,000 in an hour and a quarter, indicates clearly that following transfusion there is frequently a rapid redistribution of blood. Lamson's investigations on adrenalin polycythemia suggest a mechanism by which such a rapid alteration in the count may be brought about. In other patients a brief fall in the red cell count occurs immediately after transfusion, to be followed by a rise a few hours later. In still others there is a steady rise in the count for twenty-four hours. Finally in some a prompt rise is followed by a rapid decline, so that after twenty hours the count has reached the same level at which it was before transfusion. These variations in the red cell count are paralleled by equally varying reactions in the character of the red cells, the leucocytes, and the platelets. These remarkable results cover only a period of twenty-four hours, but had the observations been carried further no doubt equally interesting variations would have been discovered during the following days. They emphasize clearly enough our need for fuller information concerning the details of the effect of transfusion upon the blood and blood-forming organs.

Judged by their gross effects upon the condition of the patient transfusions produce various reactions.

(*a*) Following a single transfusion there may be marked improvement in the general condition and in the blood picture, and this improvement continue and a satisfactory remission be established.

(*b*) Following a single transfusion definite improvement may occur, and this improvement be held at the newly established level. Subsequent transfusions may each carry the patient in step-like progression to a higher level of improvement until a satisfactory remission is established.

(*c*) Following a single transfusion improvement may occur which is, however, transient; at the end of a week or two the patient's condition has returned to the level present before transfusion. Under such circumstances the patient may be kept alive for months by repeating transfusions at stated intervals.

(*d*) Following transfusion the improvement may be so transient that the procedure benefits the patient but little, and in spite of repeated transfusions his condition grows progressively worse.

5. Based upon the evidence that the spleen plays an important part in the destruction of red blood-corpuscles, its removal in pernicious anemia was recommended by Eppinger. The first operation was performed in 1903, and there are now many observations on record upon the influence of this procedure on the course of the disease.

If we return now to our criteria for judging the value of these methods of treatment we will find that we possess few data upon which to compare one with another. Bloomfield has analyzed the cases from the medical service of the Johns Hopkins Hospital and comes to the disappointing conclusion that in this series at least there is no evidence that transfusion, splenectomy or elimination of foci of infection prolongs the life of patients suffering from pernicious anemia beyond the average period attained by patients treated by the older methods of rest, food, and arsenic. While transfusion performed at a time when the patient was not refractory brought on remission in about half the cases, still it seemed not to increase the duration of remissions. The number of cases in this series is small, but the cases were carefully studied, and these conclusions must be credited until other more convincing figures are produced.

At the Johns Hopkins Hospital splenectomy in pernicious anemia has been performed but eight times. One patient died of pulmonary embolism nineteen days after operation; three died within a year; two within two years; one after two and a half

years; one was alive at the end of one and a half years. Four made good recoveries after operation, but the remissions lasted only from three to eight months in spite of numerous transfusions. Krumbhaar in a recent analysis has computed an operative mortality of twenty per cent. Physicians who advocate splenectomy emphasize the importance of selecting suitable cases. However, the criteria for selection are not very definite. They consist mainly of marked splenic enlargement and the evidence of active hemolysis. Even though we may admit that in such selected cases splenectomy is the most potent means to inaugurate remission, still, if we balance against this possible advantage the formidable nature of the procedure, the high death-rate, and the transient character of the benefit, we will hesitate to urge its acceptance. For these reasons splenectomy in pernicious anemia has been abandoned by the medical clinic of the Johns Hopkins Hospital.

Finally, what is to be said of the value of eradicating foci of infection? Sufficient data are not available to draw a definite conclusion. Sometimes very remarkable improvement follows their eradication; at other times the disease proceeds uninfluenced. As a part of a general plan of treatment it has an important place; as an isolated and special method it is less efficacious than some other methods, particularly transfusion.

TRANSFUSION OF CITRATED BLOOD—TECHNIQUE AND INDICATIONS.

LEWISOHN, in the *New York State Journal of Medicine* for December, 1919, states that the technique of transfusion of citrated blood consists of two separate steps: (1) The taking of the blood from the donor, and (2) the injection of the citrated blood into the recipient. Both steps are well known to any physician and do not require any special skill. The first step represents a simple venesection; the second step, an intravenous infusion.

The complete outfit for a citrate transfusion consists of the following instruments:

(1) Two glass ampoules, each containing 5 Cc. of a 2.5-per-cent sterile solution of sodium citrate.

(2) Two large graduated glass jars (500 Cc. each).

(3) Two small graduated glass jars (50 Cc. each).

(4) One glass rod.

(5) One salvarsan flask.

(6) Two cannulæ (one large size and one medium size).

The donor ought to be a strong, husky man, with large, easily visible veins of the arm. Though members of the patient's family may act as donors in emergencies, the professional donor is preferable. The donor's blood ought to be examined for syphilis, and donor's and recipient's blood must be tested for hemolysis and agglutination. The donor's blood is obtained by puncture of one of his arm veins. The cannula used for the collection of the blood must have a large caliber in order that the blood runs out fast, otherwise clotting may occur before the blood is properly mixed with the citrate solution.

Lewisohn has repeatedly collected 900 cubic centimeters of blood by simple puncture of a vein. Personally he does not believe in very large transfusions, and for that reason has not taken more than 900 cubic centimeters from a donor by puncture. Others, however, have collected 1200 to 1300 cubic centimeters by this method.

The donor will offer his services much easier if the method to be applied safeguards his immediate return to work. For this reason no method of blood transfusion can acquire general popularity, which requires incision and exposure of the donor's vein. Another important consideration is that, if puncture is used, the same vein can be used repeatedly.

The average transfusion consists in transferring 500 cubic centimeters from donor to recipient. The ampoule is emptied into one of the 50-cubic-centimeter jars. From this jar 25 cubic centimeters are poured into the large glass jar. A tourni-

quet is applied to the donor's arm and one of the prominent veins is punctured. The blood is mixed with citrate solution, by gently stirring with a glass rod. After 250 cubic centimeters of citrated blood are collected, the residual 25 cubic centimeters required for the proper citration of 500 cubic centimeters of blood are added. The cannula is then removed and the small puncture opening is covered with a piece of gauze.

The introduction of the citrated blood into the recipient resembles so closely an intravenous infusion that it hardly needs any explanatory remarks. If the recipient's vein is clearly visible, puncture of the vessel with a medium-sized cannula is the method of choice. However, the majority of patients are so anemic that the vein has to be exposed by a small incision. The cannula is then attached to the salvarsan apparatus and 50 cubic centimeters of saline solution are allowed to run in, immediately followed by the citrated blood. The preliminary injection of a small quantity of saline solution has the advantage of safely eliminating air, contained in the rubber tubing, without wasting any of the donor's blood.

The citrate method of blood transfusion was received with a certain amount of skepticism. The idea of introducing an anticoagulant into the circulatory system in the attempt to stop hemorrhages did not appeal to many people. However, it has been shown that all these objections were purely theoretical. In fact, the coagulation time of the recipient's blood is temporarily shortened after the introduction of the citrated blood (Weil). It returns to its previous antetransfusion level in about twenty-four hours. Thus citrate transfusion can be safely used wherever transfusion is indicated even in hemorrhagic diseases (hemophilia, purpura, etc.).

The number of citrate transfusions is growing rapidly in this country. Pemberton (Mayo clinic) lately has reported 1000 transfusions done by this method. Garbat has reported 100, and the author 200 transfusions. In none of these 1300 transfusions has the mixture of sodium citrate with the donor's blood caused any ill effects on the recipient. The clinical value of citrated blood is as beneficial as that of non-citrated blood. The indications for transfusion can be divided into four groups:

1. Hemorrhage.
2. Pernicious anemia and leukemia.
3. Preoperative and postoperative transfusions.
4. Sepsis.

1. *Hemorrhage.*—The hemorrhage of the hemophiliac patient is a very gratifying field for transfusion. It seems that in childhood the hemophiliac tendency may be absolutely and permanently cured by a single transfusion of blood.

Most striking results are achieved in hemophilia neonatorum (melena neonatorum). These infants are usually brought to the hospital on the second or third day after birth in a most exsanguinated condition. An interne is immediately sent to the mother's home and returns with 100 cubic centimeters of citrated blood. Blood tests are not necessary, for the mother's blood never hemolyzes the blood of the new-born infant. This blood is injected into the median cephalic vein of the baby with the aid of a fine cannula. The bleeding stops immediately in the vast majority of cases, and the children develop perfectly normally. He has treated nine such cases and has obtained practically perfect results in six.

The harmlessness of the sodium citrate for the human body is well demonstrated by the absence of any toxic symptoms in the babies, following the citrate transfusions.

Results in purpura are not nearly so satisfactory as those in hemophilia.

Gastrointestinal hemorrhage is often of such alarming nature that it requires immediate transfusion. If the bleeding is caused by an ulcer of the stomach, the transfusion ought to be followed by an operation, in order to prevent recurrence of hemorrhages.

Every severe case of typhoid fever ought to have a donor tested, even before any signs of hemorrhage occur. The trans-

fusion can then be done immediately, if occasion should arise, without loss of valuable time.

In the same way a donor ought to be on hand before a very cholemic patient is operated upon (common duct stone, pancreatitis, etc.). Many lives can thus be saved, if the emergency can be properly met.

It is unnecessary to dwell on the advantage of blood transfusion in ruptured ectopic pregnancy. The transfusion ought to be given immediately after the operation. The chances for the patient's speedy recovery are thus materially improved.

The postoperative hemorrhages following operations on stomach, kidney, bladder, etc., often stop immediately after a transfusion of blood, without any further surgical interference.

The recent world war has proven the efficiency of transfusions following traumatic hemorrhages, beyond doubt. Thousands of lives have been saved by the immediate transfusion of blood. Two methods were used by the allied forces, the paraffinized glass cylinders and the citrate method. The latter method was designated as the method of choice for the American Expeditionary Forces.

2. *Diseases of the Blood.*—No permanent cures can be expected from transfusions in pernicious anemia. However, the life of the patient can be lengthened materially and the rapid progress of the disease can be arrested temporarily by repeated transfusions of blood.

Transfusion is of very little clinical value in leukemia, especially in the acute stage.

Primary and secondary anemia often show wonderful improvement following transfusion of blood.

3. *Preoperative and Postoperative Transfusions.*—Blood transfusion as a preoperative measure ought to be used very frequently. Patients weakened by diseases of long duration will stand even large operative procedures very much better if they are transfused on the day preceding the operation.

In the same way, transfusion will hasten the convalescence of a debilitated patient after operation.

4. *Sepsis.*—The very acute forms of sepsis are not benefited by transfusion. In fact blood transfusion should not be used in these cases, as the injection of blood may cause very alarming symptoms. However, extensive use of blood transfusion ought to be made in the subacute and chronic forms of sepsis.

It seems to be the consensus of opinion that the citrate method will gradually supplant all other methods of blood transfusion. It is absolutely safe and so simple that any physician can make use of it in cases of emergency.

ACUTE NEPHRITIS BY ABSORPTION OF HOUSEHOLD DISINFECTANTS.

JONES, in the *Boston Medical and Surgical Journal* of January 15, 1920, reports the case of a man, aged twenty-eight, white, single; occupation, mill operative. Strong and healthy up to date of injury November, 1918, when he accidentally shot himself in the right foot with a 22-caliber rifle. His physician prescribed a wet dressing of creolin. The patient was instructed to use it often to keep the wound clean. After the wound was healed the patient became a convert to the efficacy of this preparation, using it daily in his bath, also in the mill for the frequent washing of his hands during his work, from above date to August 23, 1919, when he received a sting from a wasp near the ankle. This small area became infected, and by abrasion of the shoe the infection increased, deep suppuration occurred, and a large sloughing ulcer resulted. This condition was aggravated by a concentrated solution of creolin being applied by some one of the family, who, becoming alarmed at this condition, called a physician, who prescribed lysol. The patient was instructed to soak the foot twice a day in a solution made by adding one tablespoonful to enough water to cover the ulcer well. This soaking of the foot usually lasted from fifteen to twenty minutes, and the ulcer was kept wet with this solution. A relative of the

patient supplemented this treatment by soaking a cloth in the preparation, without diluting, and applying it around the ulcer. After the foot was taken out of the solution where it had been soaked it was usually very white and somewhat numb, a condition which was due to the action of the preparation on the nerve terminals of the skin. This condition would gradually disappear after a good brisk rubbing. During this treatment of the ulcer, and within a comparatively short period of time, the patient began to present symptoms of nephritis. The feet became swollen, the eyelids puffed, the urine became "bloody," lassitude with loss of appetite; then finally physical prostration occurred. A sample of "bloody" urine showed a port-wine color, medicated odor, no albumin by nitric acid or boiling test, a few casts, no sugar, a faintly acid reaction with a specific gravity of 1.018.

After examination of the history of the case, the patient being too prostrated to travel for consultation, a diagnosis was made of acute nephritis caused by absorption of the products used for wet dressings; he advised their discontinuance. In the middle of September the condition of the patient became worse. He was sent to a general hospital, where a diagnosis of "acute nephritis" was made.

On October 2, 1919, the physician on the case presented for his examination a sample of the patient's urine. The specific gravity was 1.010, acid reaction, pale lemonade in color, with a faint pink tinge as seen through reflected light; it also contained a very few casts and a faintly perceptible ring of albumin. The patient has been taken home from the hospital, is improving rapidly under a bland diet and urinary antiseptics, and abstinence from disinfectants as a dressing for the ulceration.

Jones believes that case to be of great interest inasmuch as it shows the result of too energetic treatment of broken tissues by strong disinfectant wet dressings. Solutions containing coal-tar products should be made by being first thoroughly dissolved in cold water, then adding warm water enough to bring to the desired dilution, which should be "a very pale milk color." If this method is not followed, but the solution is first mixed with hot water, there is a tendency for the oily constituents to separate and float upon the surface as oily bubbles and scum, which causes an irritation at the point of contact with the skin. Such cases are frequently found in the hands of inexperienced persons who have allowed a patient to sit too long in an improperly mixed disinfectant bath, for the relief of eczema, chronic ulcers of the legs, scabies, and vagabonds' disease; indeed, some of the latter cases exhibiting a condition similar to surgical shock, when immersed too long in a strong solution of these very useful but much abused household disinfectants.

The case also shows the folly of prescribing and leaving such solutions in the hands of the patients or relatives, who are altogether too apt to increase rather than diminish the dose prescribed. They should be firmly impressed with the possibilities of injury, both locally and systemically, whenever they depart from written directions.

THE TREATMENT OF MUCOUS COLITIS.

In the *Journal of the American Medical Association* of January 24, 1920, BASTEDO states the great rule is that patients must never get unduly fatigued either physically, mentally, or emotionally. He explains to them at the outset that they are temporarily handicapped, and therefore cannot do as much as normal people. On the other hand, he does not allow them to shirk all responsibility, but tries to get them to do as much as lies within their power, encouraging them to attempt more and more till their full powers are restored. Some women with money take matters too easily and are prone to become chronic invalids, self-centered, hypochondriac, "hipped" on themselves, and lead useless lives. They go from one physician to another, or to sanitariums, read numerous books about their disease and its treatment, and refuse to permit their ailment to be forgotten for a moment. These

patients should be induced to avoid medical books and constant examination of their stools, and in every way should be encouraged to use their faculties and their muscles in a sensible manner, neither too much nor too little. A wise nurse is a great help in managing the daily life of the female indolent patient.

General hygienic measures, such as cold spinal douches, or alternating cold and hot douches, cold morning baths, cold rubbings up and down the spine, calisthenics, and general massage, with very gentle abdominal massage, are of distinct advantage. A help in the treatment is a change of scene to get away from oversolicitous or nagging friends, or from the wear and tear of home or business. He was a physician of deep perception who replied to the inquiries of the overanxious wife: "Madam, your husband needs a rest. One of you must take a vacation." A visit to one of the spas may furnish rest and recreation away from business and friends and amid pleasant surroundings, with the advantages of hydrotherapy and perhaps the daily ingestion of laxative waters. It is well to remember that nervous people do not sleep or rest well in high, mountainous regions.

The use of tobacco and alcohol, and usually also of coffee, should be prohibited.

Bromides, in doses of from 1 to 2 gm. (15 to 30 grains) once or twice a day are indicated for a short time during the most nervous periods.

In severe cases the patient should be put to bed in charge of a competent nurse. It is bad practice, because of the effect of loneliness, to keep the patient in bed without an attendant.

The treatment of attacks of colic resolves itself into measures (1) to relieve pain and neurotic symptoms, and (2) to promote evacuation of the mucus. These patients feel pain keenly and may writhe in the attacks of colic, and they may even throw themselves out of bed.

1. The pain and neurotic symptoms may be relieved by rest in bed, a large dose of bromide, 2 to 4 gm. (½ to 1 drachm), by mouth, a hypodermic of atropine sulphate, 0.001 gm. (1/65 grain), with codeine phosphate, 0.03 gm. (½ grain), and hot applications to the abdomen in the form of a hot-water bag, electric pad, poultice or stupe, or a hot bath. On account of habit formation in neurotic subjects, morphine should not be ordinarily employed; but when the recurrence is not frequent and the attack is very severe, morphine may be the best remedy. To relieve the colic the best single drug is atropine; it is of no use for the cure of the colitis.

2. To promote the evacuation of mucus one may use (*a*) a large dose of castor oil by mouth. This acts by making vigorous peristalsis, which, coming from above the mucus, tends to separate this from above downward and to carry it onward, while at the same time it abolishes the spasmodic obstruction through the peristaltic reflex which produces dilatation below the contraction above. (*b*) Colon irrigations with tap water or a solution of sodium bicarbonate, a drachm to the pint, should be given warm and at low pressure (two feet). On account of the spasticity of the descending colon it may be impossible to get the liquid up into the colon at first, but persistence and gentleness may result in success. Irritants, such as silver nitrate, should not be employed in the already highly sensitive colon.

Often the combination of castor oil by mouth, codeine and atropine hypodermically, and colonic lavage will be followed by relief and sleep. But if the attack is very severe and persistent, and especially if the irrigation is unsuccessful, it is a good plan to put the patient in the knee-chest position and to inject slowly into the colon from one-half to one pint of warm olive oil or cottonseed oil, to be retained over night or as long as possible, a towel being placed over the anus and a rubber sheet on the bed as protection in case of leakage. This injection is often followed by the passage, a few hours later, of the oil and an abundance of mucus, with disappearance of the colic and no recurrence for a long time, if at all.

PICRIC ACID—A PREOPERATIVE DISINFECTANT.

CASSEGRAIN, in the *New Orleans Medical and Surgical Journal* for January, 1920, states that Dr. Gibson first used picric acid as a disinfectant while with the British army in France. The method used at first was the Gibson: (1) Wash the operative area with soap and water; (2) paint it with a 5-per-cent alcoholic solution of picric acid.

Very soon, however, in cases that come to the operating-room prepared the way they ought to be, he eliminated the washing with soap and water and modified the original technique: (1) by wiping the skin with alcohol, then (2) painting it with 5-per-cent picric acid. He eliminated the first step simply as a time-saver.

For the last three months at the Charity Hospital, where he had charge of the service during the summer, he used this method as routine. He averaged during that time four cases a week of appendectomies to herniotomies, one umbilical hernia, one femoral and many inguinal operations; and he had exploratory laparotomies (one case was a large ovarian cyst and another was a double pus-tube case with cystic ovary). He also did a nephrectomy for hydronephroma. In all these cases he had but one infection in an inguinal hernia; this was not the fault of the skin preparation, but from a break in the aseptic technique during the operation.

Hernias and fracture cases were satisfactorily operated with this method and did not become infected, and every surgeon knows that there is no greater test of asepsis than either a hernia or a Lane plate. Another argument in favor of the use of picric acid is that it is approximately 40 per cent cheaper than iodine, and in these times of high cost of material it should be no small inducement to any hospital management to substitute for an expensive drug one 40 per cent cheaper and as good if not better than the expensive ones.

He advocates the use of picric acid as a preoperative disinfectant because:

1. It thoroughly disinfects and can be used with soap and water.
2. It does not irritate the skin.
3. It is approximately 40 per cent cheaper than the drug now almost universally used for the same purpose.

INTRAPERITONEAL INJECTION.

AIKMAN, in the *Journal of the American Medical Association* of January 24, 1920, states that this was first used in St. Bartholomew's Hospital and was introduced in this country by Howland. Blackfan and Maxcy have also reported the successful employment of this method.

The instruments needed are a medium-sized intravenous needle, an infusion bottle, and rubber tubing. The skin of the abdomen is carefully sterilized with tincture of iodine and alcohol. The skin and subcutaneous tissue are picked up between the thumb and forefinger, and the needle is introduced in an upward direction through the abdominal wall in the middle just below the umbilicus. Care must be taken to avoid piercing a distended bladder, and while there is also danger of puncturing the intestine, no record of this accident has come to his attention. In cases in which necropsy was performed there was found a small hemorrhagic area in the abdominal wall and peritoneum, but no injury of serious importance.

When the needle has passed into the peritoneal cavity, the solution is introduced by gravity. At first he used a Luer syringe; but later he found it much easier to employ the infusion bottle. He has always used warm physiologic sodium chloride solution, of which from 100 to 250 Cc., in older children from 300 to 400 Cc., may be given every twelve to twenty-four hours; in fact, if no untoward signs develop, fluid may be given until the abdomen becomes slightly distended. However, the injection must be made slowly in all cases, and overdistention of the abdomen must be avoided. After the operation, the abdomen is covered with a sterile dressing. It has been shown by the

phenolsulphonephthalein test and by necropsy that from 40 to 60 per cent of the fluid is absorbed in one hour. The remaining solution acts as a reserve, the gradual absorption of which explains the more protracted improvement as compared to results obtained by other methods.

He had used the other methods at the Infants' Summer Hospital, but this year he chose the intraperitoneal route for children who had lost large amounts of fluid by vomiting and diarrhea. It proved superior to all other methods because of the ease and rapidity of administration, the volume of fluid that can be given at one time, and the certainty that no fluid will be lost. The results from the treatment are remarkable; and although it has been used only in the most serious cases, the results have been most satisfactory.

The following case is reported to show that repeated injections may be made without injury to the intestine:

R. C., aged one year, weighing 11¼ pounds, was admitted to the Infants' Summer Hospital, August 18, with a history of vomiting and diarrhea for the previous ten days. She was born at eight months, the delivery being instrumental; the birth weight was 7¾ pounds. The child had been breast-fed until the present illness, when she was put on condensed milk.

On admission the child had a wasted appearance and was semiconscious. The physical examination revealed slight stomatitis, coldness of the extremities, weakness, and great loss of water from the tissues; the temperature was 101.6° F.; the pulse 148. Stimulating treatment was at once instituted. On the first day she retained one-half ounce of rice water, vomiting all other fluids; on the second day seven stools were passed and very little fluid was retained. The feces contained blood and mucus. There was no improvement in the bowel condition on the third day, and the loss of fluid was producing great prostration. Since no results followed administration of fluid by rectum or the use of stimulants hypodermically, 100 Cc. of physiologic sodium chloride solution were injected intraperitoneally, with favorable results. It was not until the thirty-fifth day of the disease that the child passed normal stools; even then the bowel condition was far from satisfactory. During this time there had been an average of seven mucous and bloody stools daily; in fact, many of the movements were thick mucous stained with blood. For days in succession she would take less than one ounce at a feeding, and vomited a great part of all fluid ingested. She failed to such an extent that it did not seem possible that she could live another day. The temperature ranged from 99° to 102.6°, most of the time above 101° F. In all, ten injections of saline solution were made through the abdominal wall; ranging in quantity from 100 to 250 Cc., six being over 200 Cc.

The fluid carried the child over the critical days until the bowel condition began to improve. He had never before seen a child recover after so long and severe an illness. The recovery is evidence of the value of this method of treatment and of the safety with which repeated injections may be made through the abdominal wall.

He concludes (1) the administration of saline and other solutions is frequently of great value in carrying children over critical periods of illness, especially in diarrheas with marked loss of fluid. (2) When it is impossible to give fluid by mouth or rectum, intravenous or intra-abdominal injections are indicated. If puncture of the superficial veins proves difficult, the superior longitudinal sinus or the femoral vein may be selected.

FEEDING OF SOLIDS TO SUCKLINGS.

In the *New York Medical Journal* of January 3, 1920, LOWENBURG concludes:

1. The food elements, protein, fat, carbohydrate, water, and mineral salts, exist in all foods in varying amounts.

2. There is no reason why these materials as they exist in the vegetable and the animal kingdom, as represented by sub-

stances other than milk, when properly prepared, may not be fed to sucklings.

3. Thorough cooking and fine mechanical subdivision provide the means whereby foods (solids) other than milk may be made acceptable to the digestive apparatus of the suckling.

4. Sucklings under one year bear well a mixed diet containing comminuted solids.

5. The best age at which to commence their use is probably six months, although further clinical experience will probably demonstrate that it can be accomplished earlier. This has already been noted in malnutrition in either breast- or bottle-fed infants. Even in young infants (two to three months) an immediate gain occurs following the use of gradually increasing amounts of well-cooked farina, cream of wheat, corn-meal mush, etc.

6. The total elimination of milk, a twenty-four- to thirty-six-hour hunger period, the use of weak saccharated tea, followed by the use of the least fermentable carbohydrates (starches) and finely comminuted solids, constitute the correct treatment for diarrhea. Alkalies, such as calcium carbonate and fuller's earth, are useful additions in that they check fermentation, favor putrefaction, and are excellent thickening agents.

7. More important than the influence on weight are the beneficent effects noted with reference to mental and physical development and vigor, the increase of tissue tone, and the prevention and cure of rickets and scurvy.

LIFE EXPECTANCY AFTER OPERATIONS FOR GASTRIC AND DUODENAL ULCERS.

The *Medical Record* of January 17, 1920, in an editorial calls attention to a paper on this subject read before the American Surgical Association last June by Balfour (*Annals of Surgery*, November, 1919), in which he reports the results of investigations by the Actuarial Society of America, under the direction of Mr. Arthur Hunter, chief actuary of the New York Life Insurance Company, of all cases of gastric and duodenal ulcer operated upon at the Mayo Clinic between 1906 and 1915. As Balfour says, unfortunately there is no basis on which the results of the investigation can be compared with the results in non-operated cases, for not only are no statistics available as to life expectancy in non-operated cases of gastric and duodenal ulcer, but accurate statistics in this group will probably never be entirely possible, because the uncertainties of diagnosis discount more or less the dependability of such figures. On the other hand, surgical statistics are based on proved lesions, and on lesions in which the medical treatment has failed.

In these observations the results in the gastric and duodenal ulcer groups were compared; then each group's mortality was compared with that of a similar number of the general population corresponding in age and sex. Of 2431 patients operated upon for gastric and duodenal ulcer between 1906 and 1915, all but 108 were traced—certainly a remarkable piece of work in itself. The average age at operation for gastric ulcer was: males, 47; females, 43; for duodenal ulcer, males, 44; females, 42. The operative mortality from all causes in 545 cases of gastric ulcer was 4.5 per cent; while in 1684 cases of duodenal ulcer it was 2 per cent. Gastric ulcer, therefore, carries twice the operative risk of duodenal ulcer.

Investigation of the mortality in the years following operation shows the following facts: 521 gastric ulcer cases were under observation on an average of 3.6 years, and in that time 88 (17 per cent) died from all causes; 1651 duodenal ulcer cases were under observation an average of 3.4 years, and in that time 85 (approximately 5 per cent) died from all causes, and 91 cases of both gastric and duodenal ulcer were under observation an average of 3.8 years, and in that time 9 (10 per cent) died from all causes. In connection with these figures Hunter, as quoted by Balfour, says that, while we cannot tell how many lives have been saved by reason of operation for duodenal ulcer, it may

safely be stated that the survival of 95 per cent for three and one-half years after operation is a high tribute to surgery. With such a serious condition as gastric ulcer, a death-rate in three and a half years of 17 per cent of those operated upon seems to be low. While unable to prove the statement, Hunter believes that a much larger proportion of persons would have died but for operation, and that many years of life in the aggregate were saved through surgical treatment.

The comparative tables showing the number of deaths in the group of 521 persons operated upon for gastric ulcer and 521 persons of the general population with like distribution as to age and sex give the following:

Time following operation.	Deaths in operated.	Deaths in general population.
First year	36	8.2
Second year	21	6.5
Third year	11	4.9
Fourth year	7	4.1
Fifth year	7	3.
Sixth year and subsequent	6	5.6
	88	32.3

A similar comparison of the deaths in 1651 duodenal ulcer cases operated upon shows:

Time following operation.	Deaths in operated.	Deaths in general population.
First year	22	24.
Second year	20	18.6
Third year	9	14.3
Fourth year	10	11.2
Fifth year	11	8.3
Sixth year and subsequent	13	16.7
	85	93.1

In this last series it is rather astonishing to see that the total number of deaths in the first two years after operation is exactly the same as that of the general population group, and that after the second year the mortality is actually less than in the general population group. As Balfour says, these statistics illustrate very strikingly the fact which has always been recognized by surgeons, namely, that gastric ulcer is a much more serious condition than duodenal ulcer, not only from an operative standpoint, but from a standpoint of after-results; and that the patient with a gastric ulcer shows, as a rule, much more evidence of impaired general health than does the patient with duodenal ulcer.

THE CONTROL OF HEMORRHAGE FOLLOWING REMOVAL OF THE TONSILS.

MOORE, in the *Proceedings of the Royal Society of Medicine* for December, 1919, states that the needle which he uses was introduced to the profession three years ago, and is fully described by him in a former article on the same subject in the *Practitioner* for 1918. It is an ordinary curved needle attached to a long handle with the eye at the distal extremity, and is at the present time used by many of his colleagues. With this needle is supplied a suture hook for securing the ligature at the needle point, but it has been found that the hook is not really required since any forceps are applicable for this purpose.

The great advantage of this ligature

FIG. 1.—Needle for suturing the faucial pillars. The same needle can be used for either side.

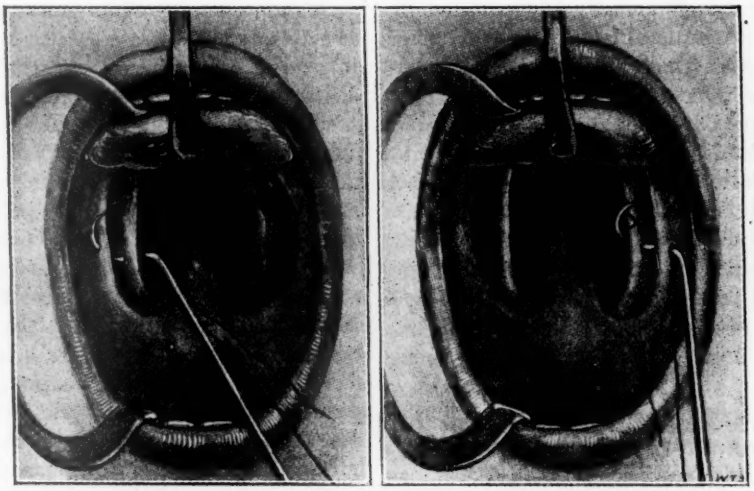
FIG. 2.—Ligature hook.

FIG. 3.—The arrest of hemorrhage after removal of the tonsils by temporary suturing of the faucial pillars. Shows the needle (threaded with catgut suture) passed through the faucial pillars, also the method of securing and drawing the suture through the needle by means of a long hook, when the patient is in the dorsal recumbent posture and the operator on the right-hand side of the patient.

needle over others is that ligatures may be easily and quickly inserted—only one needle being necessary for either side of the fauces,

and a ligature can be inserted either facing the patient when he is in the recumbent position, or when he is in the more recent and safer posture of full extension of the head, the operator standing at the head of the patient.

There is nothing original in ligaturing the faucial pillars, for Professor Luc has advocated this procedure for some years in all cases of tonsillectomy in adults, and during recent years he has followed his advice, and has been in the habit of temporarily ligaturing the pillars in all adult cases as a prevention of postoperative hemorrhage.



L. R. L. R.

FIG. 4.—Shows how the same needle may be used when the patient is in the dorsal recumbent posture with overextension of the head, and the operator standing at the head of the patient.

USE OF DIONIN IN WOOD ALCOHOL BLINDNESS.

FENTON, in *Northwest Medicine* for January, 1920, states that a recent case of methyl alcohol poisoning suggested a method of early treatment of the distressing eye symptoms. The patient, a young professional man, obtained about four ounces of what he considered grain alcohol from a stock bottle in a drug store, pouring it out himself. He consumed almost all of it, mixing with ginger ale, during the afternoon and evening of New Year's Day. No discomfort was noticed until he awoke next day with vision down to the perception of large objects, polyuria, and other characteristic wood alcohol symptoms. He resorted to free saline purges, diuretics, and took much acid in the shape of fruit juices and sour foods.

When examined four days later he presented the usual dilated pupils without reaction for light or accommodation, vision reduced to 2/200, loss of red and green perception, and a large central blind spot in each eye. The retinæ were very edematous above, below and toward the macula from the optic disc. There was a deep-seated ache behind both eyes.

A solution of dionin, 5 per cent, was instilled into each eye, with the usual reaction of smarting and swelling of the conjunctiva. The aching previously complained of was much less in an hour's time. Free use of sodium bicarbonate by mouth was advised, and he was sent home to use the dionin daily for three days.

On his return vision was 20/20 right, 20/15 left; he reported awakening the morning following the first use of dionin seeing all objects fairly clearly, but tinged with red; in an hour's time they had turned green, and by afternoon had resumed normal colors. Analysis had disclosed the fact that he had taken denatured alcohol by mistake, comprising 90 per cent ethyl alcohol,

10 per cent methyl alcohol, and perhaps half a grain of corrosive sublimate to the ounce. He is continuing the use of the dionin three days in each week. It is not unlikely that some postneuritic atrophy may follow and again reduce his vision somewhat, because the retinal edema is still present, though much diminished.

This instant local lymphagogue action of dionin is not dangerous, although the smarting and redness are uncomfortable for a short time. It is hoped that prompt use of this substance in 5-per-cent solution may be made in other cases of wood alcohol poisoning, even if it is not immediately possible for an oculist to examine them. Any measure that affords a decongestive action to these poisoned optic nerves should find early if cautious employment.

INTRATRACHEAL INSUFFLATION OF ETHER IN OPERATIONS WHICH INVOLVE BLEEDING INTO THE AIR-PASSAGES.

SHIPWAY, in the *Proceedings of the Royal Society of Medicine* for December, 1919, states that from the point of view of the anesthetist, chloroform is not such a good anesthetic as ether for extensive and prolonged operations. It is too depressing. Ether, on the other hand, especially when given by modern methods, is known to be capable of sustaining the blood-pressure over long periods and to have rid itself of its former reputation of setting up irritation of the lungs. The results that have been obtained in other fields of surgery favor the use of ether, and he believes that the figures given in this paper show that chloroform has received another setback. He submits, then, that the intratracheal insufflation of ether is a very valuable method in intraoral surgery, can be used with confidence in the young and the old, has abolished the risk of aspiration-pneumonia, and has much reduced the mortality.

In discussing Shipway's paper, F. F. Burghard said he was much indebted to the intratracheal method of anesthesia for operations upon the tongue and mouth. Those who have operated upon extensive cancers of the tongue by this method must have been surprised at the perfect smoothness of the anesthesia, the total absence of leakage of blood into the air-passages, and the freedom from interference with the surgeon's work by continuous sponging. There is no need to sponge more often than is necessary to get a good view of the field of operation; it is quite unnecessary to sponge the upper airway. This method is greatly superior to preliminary laryngotomy; in the latter, not only is the patient exposed to such risks as the operation entails, but he is not rendered immune to the danger of blood getting into the air-passages, for it is very common for an assiduous assistant to pull out the sponge plugging the pharynx in the efforts to keep the field of operation clear. The risk of carrying infection to the lungs directly via the catheter appears to be imaginary. Experience shows that the septic pneumonia does not follow the method, and no case of implantation infection of malignant disease has been so far charged to it. When the cancer reaches close down to the upper laryngeal orifice it may be a little difficult to keep out of the way of the tube, but this is a difficulty easily got over with a little care and is counterbalanced by the security against entry of blood into the air-passages.

EFFECTS OF ETHER AND MORPHINE ON THE BLOOD AND CIRCULATION IN SHOCK.

CATTELL, in the *American Journal of Physiology* for February, 1920, states that the blood-pressure of animals in shock becomes very sensitive to the effects of ether and chloroform, the inhalation of an amount insufficient to abolish the eye reflex causing a large drop in pressure. This degree of anesthesia was without permanent effect on the blood-pressure of unshocked animals. The same degree of anesthesia produced by nitrous oxide and oxygen in the most favorable proportions (usually three parts nitrous oxide to one of oxygen) given to animals in this condition caused no fall in blood-pressure. After a large dose of

intravenously injected adrenalin the ether fall was much less or entirely absent. Pituitrin was without effect. In this condition of shock after prolonged low blood-pressure the vasomotor center is quite insensitive to stimulation by asphyxia, and it is suggested that this increase in ether effect may be due in part to an impairment of the vasomotor center. In the unshocked animal the decreased heart output resulting from the administration of ether may be compensated for by a reflex peripheral constriction. This does not occur in the shocked animal, and the pressure continues to fall to zero.

Morphine given in large doses did not accelerate the development of shock produced by reducing the blood-pressure to 60 mm. Hg by means of pressure in the pericardium. Determination of the alkaline reserve at a shock blood-pressure did not show the usual fall when morphine was given, or if it was given after acidosis had already developed the reading returned nearly to normal. The results are summarized in the table, the figures representing the average per cent of carbon dioxide in samples of the blood plasma taken at the times indicated.

	Number of cases.	Duration of Low Blood-pressure (60 mm.).			
		Start.	1 hour.	2 hours.	3 hours.
No morphine.....	8	34.7	27.1	26.1	26.1
Morphine after first hour.....	8	30.1	21.9	23.9	27.6
Morphine at first....	6	33.5	32.2	34.0	34.7

WOOD ALCOHOL POISONING.

HUBBARD, in the *New York Medical Journal* of January 3, 1920, states that physicians, especially ambulance surgeons, in the present condition, should be on the lookout for these cases. Physicians should, under the present and unpopular prohibition regulation, inform their families regarding the danger of promiscuous drinking, and especially of brews made by persons not familiar with compounding beverages. They should especially caution all those inclined to seek information as to home-made preparations not to purchase alcohol from paint stores and the like.

The authorities should strenuously prosecute all persons adulterating food or drink with wood alcohol. Our judges should make an example of these offenders, causing them to know that special consideration will not be given them. The danger is grave. The remedy must be severe.

The public must appreciate that violators of the prohibition law cannot be trusted, and if they aid or abet its violation there is a danger not only serious but disabling if not fatal in its initial performance.

Trade names, columbian spirits, cologne spirits, colonial spirits, standard wood spirits, union spirits, eagle spirits, green wood spirits, Hastings spirits, and acetone alcohol, purified alcohol, and others, are names for methyl alcohol or wood alcohol in common parlance.

The public must see that users of wood alcohol observe the regulations, see that packages are properly marked, labeled with skull and cross-bones, and that the warning notice is conspicuous on the package. It might also be fittingly suggested that the following might be added: *This fluid, taken internally, is likely to produce blindness.*

INFECTIOUS DIARRHEA.

In the *New Orleans Medical and Surgical Journal* for January, 1920, KINBERGER states that investigations by Kendall point out the fact that dysentery bacilli when grown in media containing an excess of carbohydrates use the carbohydrates first and only enough proteid to furnish the nitrogen requirements of their living body structure. Since the toxic products are largely the result of protein breakdown we should expect the minimum of toxic products in the presence of an excess amount of carbohydrates. So the treatment consisted in furnishing carbohydrates in the form of dextrose or dextro-maltose solution as high as 8, 10 or 15 per cent strength. In these cases in which the vomiting was not severe, this was administered by mouth. Contrary to this line of

treatment the gas bacillus flourishes in carbohydrates, and given carbohydrates it will continue to multiply and aggravate the clinical symptoms. The little patient ill with gas-bacillus infection would grow steadily worse if fed on high carbohydrate and improve on a diet low in carbohydrates. In the treatment of this type lactic acid milk or Eiweissmilch was fed to these patients, the lactic acid being detrimental to the development of the gas bacillus. The improvement was conclusive. In the severe types of infection there was really a true toxic shock, and the symptoms had to be combated by other means than diet.

While truly an intestinal disturbance, the treatment was like that of any of the acute infections. A safe diet was a formula of fat-free milk, ripened with lactic acid bacilli, a formula low in fat and protein with a sugar proportion of about 5 or 6 per cent. Special symptoms to be treated were pain, tenesmus, marked prostration and collapse, toxic nervous irritation, vomiting, and high temperature. Hot stupes were used to alleviate the pain. Paregoric was used to check excessive peristalsis. Caffeine sodio-benzoate ⅛ to ½ grain hypodermically was found to be the best stimulant; brandy by mouth according to age. For the treatment of collapse, fluid by hypodermoclysis, giving from 4 to 6 ounces every four hours. Another method was to give six ounces of normal saline with 5-per-cent dextrose intraperitoneally. A 28-gauge lumbar puncture needle was inserted one or one and a half inches below the umbilicus in the median line at an angle of 45 degrees. The same care should be exercised in preparing the abdomen as for a laparotomy. There is no danger of injuring the intestines, and this is a quick means of furnishing fluid and stimulation. Fuel in the form of 5-per-cent dextrose or glucose given intravenously—in infants under 18 months in the longitudinal sinus, the site of the injection being the posterior angle of the anterior fontanel. A special apparatus was contrived for this purpose—a three-stop cock, connected with a Luer syringe at one outlet, and two leads of rubber tubing, one connected to the solution to be given and the other with the needle to be inserted in the sinus. In all injections a small amount of normal saline was run through first. After inserting the needle suction was applied to determine if within vein. Then a slow, steady pressure was exerted to give the solution. Four ounces of fluid was injected at one time. Sometimes there would be a rise of temperature after dextrose was given; this would fall quickly, however. Adrenalin (1:1000) one to five minims, was at times added to dextrose. For nervous symptoms sodium bromide according to age was found the best drug. Lumbar puncture was also done to relieve intracranial pressure.

In conclusion, in undertermined cases it is best to give one diet, then observe. If favorable results continue, if temperature rises change to protein. The necessity of supplying fluids is urgent, as much as 24 to 32 ounces in twenty-four hours. The dysentery was treated entirely from a dietetic standpoint. Outside of initial dose of castor oil there was very little medication by mouth. In cases passed the acute stage a small dose of milk of bismuth was used, if stool remained rather frequent. Prognosis should be always guarded.

ANESTHETICS IN OBSTETRICS, WITH SPECIAL REFERENCE TO NITROUS OXIDE.

COBURN, in the *Medical Record* of February 28, 1920, asserts that the fleeting character of the anesthetic properties of nitrous oxide makes it especially adaptable for obstetrical conditions. It requires only a few inhalations to relieve the patient, and only a few exhalations to remove the gas entirely from the patient's system. Even in an administration covering several hours the patient is actually inhaling nitrous oxide only a small fraction of the time, and the patient should be conscious all of the time—that is, until the head is passing over the perineum. It is the analgesia, and not the anesthesia, that is desired to relieve

the pain of the contractions, and nitrous oxide does this without interfering with the contractile force. The analgesic state —that is, where the patient is relieved of pain but is still conscious—is reached just before unconsciousness and anesthesia. With such a quickly acting agent this may seem a fine distinction, but with a little experience the distinction is readily made in practice.

The chief point in the technique of nitrous oxide analgesia is to begin the administration at the first indication of a uterine contraction, so that the patient may inhale sufficient of the gas before the maximum of the contraction is reached, and thus prevent actual pain from being experienced, and then discontinue the administration before unconsciousness is produced. In some patients two or three inhalations of nitrous oxide are sufficient to ward off the pain of a contraction, while in other patients six or eight inhalations are needed. At the end of the required number of inhalations the patient should be instructed to hold her breath as long as possible, and bear down. Securing the coöperation of the patient in this way materially shortens the period of labor, as nitrous oxide so administered does not retard the expulsive effort; and herein lies the great difference between the results of nitrous oxide and those of ether or chloroform in this phase of obstetrical practice, as both ether and chloroform decidedly decrease the force and frequency of the contractions, and thereby, of course, prolong the period of labor.

It is to be distinctly emphasized that until the head is passing over the perineum it is a state af analgesia, and not of anesthesia, that is desired during the contractions. That is, consciousness should be maintained throughout, with pain assuaged or obliterated. Loss of consciousness, of course, destroys the coöperative effort of the patient, and the conscious coöperation is a great factor in shortening the labor.

Nitrous oxide analgesia should be instituted as soon as the contractions produce a decided pain. This will vary considerably with different patients. With primiparæ when "four-finger" dilatation is reached the pain is usually pretty acute, while multiparæ usually do not have much pain till after considerably more dilatation has occurred. The object of the analgesia is to relieve pain, so unnecessary suffering should not be allowed before instituting it. On the other hand, the administration should not be begun until the patient, on account of the pain she experiences with the contractions, is willing and anxious to coöperate in obtaining relief and in assisting the expulsive effort. Considerable patience is sometimes required to get proper team work instituted, and without coöperation of the patient this intermittent administration for each individual pain cannot be made a success. As the labor progresses and, of course, as the pain becomes more severe, there is an increasing tendency for the patient to coöperate.

When the head is passing over the perineum, many obstetricians prefer to have their patients anesthetized, and some prefer to have them at this time rather deeply anesthetized. This can be done by adding ether to the nitrous oxide, or by giving straight ether. The response of the patient, as well as the requirements of the obstetrician, determine how the administration should be conducted at this stage, and the same rule applies to the administration of the anesthetic for the repair of the lacerations, if there be any, nitrous oxide, of course, being the preferred anesthetic.

Conserving the patient's vitality is another very important benefit of nitrous oxide analgesia. Many patients, especially primiparæ, are so exhausted by their suffering that before the end of labor they are physically unable to coöperate in the expulsive effort, and this at the very time when cooperation renders the maximum benefit. Not only does this unnecessary exhaustion of the patient delay the progress of labor, but often necessitates the use of forceps which otherwise would not be required. The exhausted parturient patient is also much more liable to hemorrhage, infection, and the latent ills to which she may be

subject, than is the one whose vitality is conserved by the prevention of her sufferings. With the patient's vitality so conserved, there follows, of course, a more rapid convalescence. In other words, nitrous oxide analgesia, in a measure, is life insurance.

Apparatus for the administration of nitrous oxide varies about as much as styles of dress. Coburn prefers and uses a very simple design. Elaborateness does not establish efficiency. Many of the different kinds of apparatus on the market were designed for use in general surgery, where a continuous administration is desired, and so they are not well adapted for the brief, intermittent administrations in obstetrical analgesia. Little oxygen is required for the majority of patients until the stage is reached when a continuous analgesia or anesthesia is indicated—that is, when the head is passing over the perineum. Cyanosis, however, should not be permitted at any stage. Oxygen and air are the antidotes, and the latter is always available. Analgesia is usually produced before cyanosis develops.

Coburn asks the question, What are the comparative effects of the different anesthetics on the baby? And his answer is as follows: In intermittent administration of nitrous oxide as herein outlined very little nitrous oxide reaches the baby, for its administration is not begun until uterine contraction has commenced, and its administration is discontinued before the contraction ceases. Spontaneous respiration in the baby appears to be as quickly and as easily established after intermittent nitrous oxide analgesia as when no anesthetic is administered. Ether and chloroform, on the other hand, are a distinct deterrent to spontaneous respiration, as is generally observed. The length of time over which nitrous oxide analgesia is maintained does not affect the spontaneity of the baby's respiration. The longest period for which Coburn has maintained nitrous oxide analgesia is nine hours, and with several other cases nearly as long. Yet in these prolonged administrations there was no difficulty in establishing the baby's respiration.

"The proof of the pudding is in the eating," is an adage to which most all will subscribe. That is the kind of proof the mothers and babies offer concerning nitrous oxide analgesia.

Coburn reiterates the salient points: Freedom from pain of any consequence, vitality conserved, no extra toxic burden on the already overburdened organs of elimination, period of labor shortened, resistance unimpaired, more rapid convalescence, spontaneous respiration of the baby. He says this is not an *ideal* picture, but a *real* picture. It is, then, not too much to claim that nitrous oxide analgesia is the greatest contribution to obstetrics that has been made in the present decade.

LOCAL ANESTHESIA.

NOEHREN, in the *New York Medical Journal* of December 27, 1919, asks the question, What are some of the disadvantages and limitations of local anesthesia? Like all other surgical procedures, it must be used with good judgment and in suitable cases. Certain operations, such as extensive explorations, cannot be satisfactorily done under local anesthesia, but their number is diminishing as the technique is being improved.

Nervous patients often dread the possibility of suffering pain, and consequently are too ready to react to a sensation of any kind, even if not painful. However, if the confidence of these patients can be secured and they are assured by other patients who have been operated upon under local anesthesia that there really is no pain, they too can be operated upon successfully in this way, especially after the administration of a sedative. In young children local anesthesia is difficult, although some men report that it is no more difficult than in adults.

Operations seem to take a little longer on account of the time it takes to inject the solution, but when one considers the time necessary to anesthetize a patient with ether, it really does not take any longer to

operate with local than with general anesthesia.

Tissues must be handled gently, and while this may be a disadvantage to the surgeon in some cases, it is a distinct advantage to the patient and a check on the work of the surgeon. It requires that the surgeon keep himself well under control, show no sign of nervousness, and by this quiet behavior keep the patient from becoming excited. Not all men are adapted by disposition for this kind of work, and in any case it is more trying to the surgeon. However, when we consider the great advantage of local anesthesia to the patient, these objections should not deter us from using it.

Before taking up the subject of technique, let us consider the pain sensations of the various tissues of the body. In the following table these are placed under three headings: (1) those with no sensation; (2) those with slight sensation; and (3) those with very acute sensation.

No Sensation.	*Slight Sensation.*	*Acute Sensation.*
Thoracic organs.	Except when traction applied.	Skin.
Abdominal organs.		Pleura.
Visceral peritoneum.	Mesentery.	Parietal peritoneum.
Kidneys.		Mucous membranes.
Ureters.		(near orifices).
Thyroid gland. Lymphatics of neck		Capsules / Covering them.
Esophagus.	Connective tissue.	Blood-vessels, while covered with connective tissue.
Trachea.	Muscles.	
Brain.	Fascia.	
Pia-arachnoid.		
Dura (convexity of brain).	Dura (lower part).	
Bone.		Periosteum.
Cartilage.		Perichondrium.
Neoplasms.		Tendons.
Granulations.		

A study of this table shows that abdominal operations require anesthesia of the abdominal wall only, provided no traction is made or the mesentery divided; that the same is true of the chest; that bone, cartilage, thyroid gland, lymphatic glands, brain, and neoplasms can all be painlessly operated upon, provided their coverings are anesthetized.

Of the various forms of local anesthesia only the two most important, infiltration and conduction anesthesia, will be considered here. In the former the anesthetic solution is injected at the point of operation; in the latter at some distance from it, the so-called nerve blocking.

Infiltration is the simplest and best method in most operations, but occasionally a combination of the two is necessary. Exact nerve blocking—*i.e.*, injecting directly into the nerve supplying the operative area—is too difficult and uncertain for ordinary use, and, furthermore, is unnecessary in most cases. Where it is necessary, it is better to infiltrate the region through which the nerve passes rather than attempt to "spear" the nerve itself.

As already indicated, the discovery of novocaine made local anesthesia a safe procedure, and it is still the anesthetic of choice. Since the war it is manufactured in the United States under the name of procaine, which is identical with the original novocaine. Of the many other agents on the market, he has had experience with only one, apothesine, and it has given just about as good satisfaction as procaine.

The use of adrenalin in combination with the anesthetic has made local anesthesia even more safe and efficient. When combined with the anesthetic in strengths of one in 200,000 to one in 500,000, it causes just enough vasoconstriction to keep the anesthetic from entering the general circulation too rapidly, thus prolonging its anesthetic effect and lessening its poisonous effect. The adrenalin may be added to the solution, or it may be procured in combination with procaine or apothesine in tablet form. This latter is the best way to make the solution, as the tablets do not deteriorate, are easily handled, and the solution may be sterilized without diminishing its power. Procaine is used in one-half- to two-per-cent and apothesine in one- to two-per-cent solutions. In these strengths there is no danger of any toxic effects, except where exceptionally large massive infiltrations are made. These solutions

should be isotonic, consequently the lower percentages are best made up with salt or Ringer's solution.

The preoperative treatment and technique for an operation under local anesthesia that have proved most satisfactory to Noehren are as follows: The patient enters the hospital the night before the operation and is given fifteen grains of triple bromides and five to ten grains of veronal. Forty-five minutes before the operation, which is usually done in the morning, one-quarter grain of morphine is given hypodermically. The patient is taken to the operating-room quietly, preferably on the operating table, and great care is used to make him as comfortable as possible. If the patient does occasionally complain during the operation, it is usually not from any pain at site of wound, but rather from backache or other aches caused by his position. The assistants and nurses are instructed not to speak loudly and not to rattle instruments or dishes.

Under these conditions about one-half of the patients will sleep or doze during the operation. In an extensive goitre operation he removed one lobe without waking the patient; then a doctor came into the operating-room, started to converse in a loud voice, and wakened the patient. Although she suffered no pain during resection of part of the other lobe, she became restless and complained of backache.

When the patient does not sleep, it is wise to speak to him occasionally, preferably in a jocular way, to take his mind off the operation. One witty old lady of sixty-five kept the operating-room personnel in a state of uproar with her funny sayings, while she was being operated upon for a femoral hernia. But it is preferable to have the patient sleep, and often a second dose of morphine is advisable.

The needles used in the injection should be of fine bore, twenty to twenty-two gauge, to diminish the danger of injuring blood-vessels, and should be at least two and one-half to three inches long, so that fewer punctures through the skin need be made. For work at unusual angles, a shorter needle should be at hand. The needles must fit snugly and the syringe should be of comparatively small diameter, so that greater pressure may be made. The pneumatic injector of Farr and the self-filling syringe of Bessesen make possible a uniformly continuous stream of solution, but he prefers the simple syringes to a complicated apparatus that is likely to get out of order and makes perfect asepsis more difficult.

The first injection is made at one end of the proposed line of incision, and this is the only needle prick that the patient should feel. Here a wheal is made. The needle is then pushed along in the subcutaneous tissue close to the skin, always keeping up a continuous injection into these parts. When the end of the needle is almost reached, the point is again pushed into the skin from below and a second wheal made, through which a fresh puncture can be made without pain. This takes care of the skin and subcutaneous tissue. A series of punctures about one inch apart are then made into the deeper tissues beneath the fascia. The incision can now be made through skin and fascia without any fear of pain.

THE ROLE OF THE VAGI AND SPLANCHNIC NERVES IN THE GENESIS OF SHOCK FROM ABDOMINAL OPERATIONS.

Ivy, in the *American Journal of Physiology* for February, 1920, states that in his experiments on dogs both vagi were cut intrathoracically above the diaphragm and both splanchnics were sectioned and the celiac plexus with the ganglion extirpated, thus isolating the intestines from the central nervous system. Such animals, if properly cared for, recover quickly and live in good health. After recovery (four to six weeks) the animals were tested under local anesthesia (novocain-adrenalin). The left carotid was cannulated for blood-pressure, the abdomen opened widely, and the intestines were vigorously manipulated. No signs of pain were observed except when the mesentery was pulled. Care was taken

to avoid this and all other causes of pain. Samples of blood were drawn at intervals from the inferior vena cava by syringe, and hematocrite, hemoglobin, red blood corpuscle count and plasma bicarbonate determinations were made. The body temperature of the animals was followed. The same procedure was carried out on normal controls.

The following observations were made: It was possible to produce shock by vigorously manipulating the intestines of animals in which both vagi and splanchnics had been sectioned and time allowed for recovery from the operation. However, it took from three to five times longer to produce shock in dogs with isolated intestines than the intact control animals. Also, the fall in blood-pressure was much more gradual in the former than in the latter. The blood changes in both series of animals were practically the same as those reported by other observers working on shock. Marked congestion of blood and loss of irritability of the intestine to mechanical stimulation appeared sooner in the control animals than in the animals with isolated intestines.

The conclusion is warranted that the vagi and splanchnics are not directly concerned in the genesis of shock produced by manipulations of the intestines, but the presence of these nerves does hasten the onset of shock.

DON'TS IN DERMATOLOGICAL DIAGNOSIS.

SCHOLTZ, in the *Southern California Practitioner* for February, 1920, says:

1. Do not try to make a diagnosis on the general impression of the eruption, just because it looks like eczema, psoriasis, etc., but base it on the presence of definite clinical characteristic features, and on the study of individual lesions.

2. Do not be satisfied with the examination of the part of the body that a patient chooses to show you, but see all of it in doubtful cases. If you do not, you may miss the most characteristic patch and your clue to diagnosis.

3. Do not make any definite statements as to diagnosis under artificial light. The daylight may completely reverse your opinion.

4. Do not call an eruption "eczema" unless most or all of the following clinical features are present: Irregular round or square shape, ill-defined borders, marked tendency of individual lesions to run together into patches, equal involvement of the central and peripheral parts, spreading by continuity, intense itching and absence of scarring.

5. Do not forget, whenever in doubt, about the possibility of the lesion being syphilitic. The following "specific" features suggest and, if present combined, clinch the diagnosis: raw ham, dusky-red color, serpiginous or kidney shape, deep induration or infiltration, absence of itching, comparatively rapid involution, tendency toward ulceration and formation of thin, soft, atrophic, wrinkled "cigarette paper" scars.

5. Do not venture a diagnosis on the scalp until you clean it up and take off the crusts to see the base of the lesion. A dirty, insignificant looking crust may conceal a number of various conditions.

7. Do not overlook scabies in your well-to-do patient. Scabies once in a while breaks into the best of society.

8. Do not wait for silvery white scales to diagnose psoriasis. The patient may have washed them off before coming to see you. The distribution and character of the base of the lesions will furnish enough for a safe diagnosis.

9. Do not take every red patch in babies on the buttocks and around the genito-crural region for an intertrigo from soiling. If it is of a sluggish, dusky-red color, of well-defined borders and slightly infiltrated, it may be the only evidence of hereditary syphilis.

10. Do not depend in your dermatological diagnosis on the statements of the patient. In a majority of the cases, with a systematic checking up of clinical features and careful differentiation, you can tell him more than he can tell you.

THE POTENCY OF SOME FRENCH DIGITALIS PREPARATIONS.

LEVINE, in the *Boston Medical and Surgical Journal* of January 15, 1920, states that the first preparation tested was Arnaud's crystallized ouabaine. A similar preparation used in New York has been tested out by Hatcher and Brody, and it was found that the M. L. D. (minimal lethal dose) for cats was 0.0001 gramme per kilo weight. In a recent work this was found to be true, and other observers as well agree with the above results. Four cats were given slow injections of Arnaud's ouabaine. The first cat received 0.00002 gramme every six minutes and died after the sixth injection; the M. L. D. was 0.000053 gramme per kilo. The second (weight 2.0 kilo) received the same dose every six minutes and died three minutes after the fifth injection; M. L. D. in this instance was 0.00005 gramme per kilo. The third (weight 3.3 kilo) was given 0.00004 gramme every six minutes, and death followed one minute after the fifth injection. The M. L. D. was 0.00006 gramme per kilo. The last cat (weight 2.6 kilo) was given 0.00002 gramme every six minutes, and death followed after 0.00019 gramme was given. In this instance the final injection was only 0.00001 gramme, as it was quite evident that death would ensue with this dose. The M. L. D. was 0.000073 gramme. The average M. L. D. of the four experiments was 0.000059 gramme per kilo.

A definite discrepancy exists, therefore, between the potency of Arnaud's ouabaine used in France and the ouabaine used in New York, because the M. L. D. for cats of the latter is 0.0001 gramme per kilo. This difference may be due to the fact that the New York preparation is crystallized strophanthin (gratus), and although he does not know the nature of the French preparation, it may be a crystalline substance derived from the ouabaine plant. In any event the French preparation is almost twice as potent as the one used in the United States, and therefore should be employed in practical therapy in correspondingly smaller doses. Vaquez and Lutembacher report nearly 2000 intravenous administrations of Arnaud's ouabaine without any bad results. They used 0.00025 gramme, not repeated during the first twenty-four hours.

The other French preparations tested were Nativelle's crystallized digitaline in sterile ampoules in oil and in tablets. Four experiments were made, using the former, and it was found that the average M. L. D. was 0.00086 gramme per kilo. This indicates that it is about one-eighth as potent as crystalline ouabaine used in New York and about one-fourteenth as potent as Arnaud's ouabaine. The oil in which the digitaline was dissolved did not play any part in these experiments, although it was injected intravenously, because the following experiments using the same active principle, but suspended in salt solution, gave practically identical results. Three experiments were carried out, using Nativelle's tablets of crystallized digitaline. The average M. L. D. of this preparation was found to be 0.00072 gramme per kilo. The tablets were not altogether soluble in salt solution but formed a fine suspension. Typical digitalis deaths were, however, obtained after the injection of amounts practically identical to those required when the digitaline was dissolved in oil.

To compare the above results with a more familiar digitalis preparation, a Parke, Davis & Co. tincture of digitalis was tested. This particular tincture was bottled September, 1916, twenty-two months previous to these experiments. Four cats were used, and the average M. L. D. of this tincture was found to be 0.8 Cc. per kilo or 0.08 gramme of digitalis. This indicates a very active drug, for in testing out a good tincture of digitalis Hatcher found that the M. L. D. for cats was 1.0 Cc. or 0.1 gramme per kilo of digitalis. A question came up as to whether the alcohol in the tincture played any part in causing the death of the animals. For this reason a control cat was given five times the volume of 47-per-cent alcohol (the strength of the tincture) intravenously in the same time without producing

any toxic effect on the heart. The possibility of using the tincture of digitalis intravenously in human therapy immediately presents itself. Why this has not been in vogue in the past he believes must be due to the fear of causing coagulation of the blood elements by using an alcoholic preparation. This point may be decided more definitely, and in addition the margin of safety—*i.e.*, the difference between the M. T. D. (minimal toxic dose) and the M. L. D. (minimal lethal dose)—for such intravenous administrations will also have to be determined.

In comparing the M. L. D. of the various drugs he finds that approximately 0.00006 gramme of ouabaine, 0.0008 gramme of digitaline, and 0.8 Cc. tincture of digitalis are equivalents when given intravenously to cats. It is dangerous to translate these figures directly into similar ratios for human dosage. Exactly the same relationship need not exist in the dosage of these drugs when given in ordinary therapy, but the above figures are of some value in guiding us in the use of these drugs. The manufacturers of Nativelle's digitaline advise physicians to give 0.00025 mg. of digitaline four times a day when the drug is to be used in large doses, and once a day when small doses are desired. Attention may be called to the fact that the dose of 0.00025 gramme is one-fourteenth as potent as the same amount of ouabaine, and is equivalent to 0.3 Cc. of tincture of digitalis. It appears questionable, therefore, whether the doses of digitaline advised by the manufacturers are sufficient, even in view of the fact that digitaline may be absorbed more quickly than the tincture of digitalis when both are given by mouth. Furthermore, French digitaline is said by Clark to be almost pure digitoxin; and the margin of safety in the use of digitoxin is generally thought to be quite small. Perhaps for this reason such small doses are employed.

He concludes:

1. The potency of Arnaud's ouabaine and Nativelle's crystallized digitaline was determined, using the cat method of Hatcher, and was compared with an active tincture of digitalis.

2. The M.L.D. (minimal letal dose) of Arnaud's ouabaine was found to be 0.000059 gramme per kilo.

3. The M.L.D. of Nativelle's crystallized digitaline was 0.00086 gramme for the sterile oil ampoules and 0.00071 gramme for the tablets.

4. From these figures it is suggested that the dose 0.00025 gramme of digitaline which the manufacturers advise using appears to be too small for good therapeutic results.

EPIDEMIC CEREBROSPINAL MENINGITIS.

In the *Pennsylvania Medical Journal* for February, 1920, SAILER states that the amount of the serum to be administered is fairly definite. It should be about 10 Cc. less than the amount of fluid withdrawn. If this rule is observed no symptoms of pressure other than perhaps a very slight transient headache will ever be produced.

The frequency of administration will vary somewhat with the opinion of the physician. In the bactericidal sera, however, the rule is to introduce as much of the serum as possible. Therefore, as the amount is governed by the amount of fluid withdrawn, frequency of administration must be employed in order to administer a sufficient quantity. In the beginning of the case twice and even three times a day is not too often. After the symptoms subside it should be repeated at least once a day until the temperature becomes normal, and it is his rule to continue it for about one or two days more. In severe cases he often gives it three times a day, and apparently with good results.

There are various methods of administration. Either the lateral or the central puncture can be used. The third or fourth lumbar interspace is the point of puncture, but it can be given either higher or occasionally in the fifth interspace without any disadvantage. General anesthesia is not

required. Local anesthesia may occasionally be employed, but as a rule the puncture of the needle is little more painful than the puncture of a hypodermic needle. In the hands of a skilful man a steel needle is quite as safe as one of the bendable alloys and usually is more satisfactory. It should be thrust in steadily and without twisting, and if one has learned the technique the sensation given by piercing the dura is usually easily recognized. If it is desired the spinal pressure can be measured by simply slipping a rubber tube over the end of the needle and a glass tube into the end of that. The height to which the fluid rises is measured when it has ceased to rise. This usually requires about one minute or less. Mercury manometers are more complicated and less satisfactory. The fluid should be allowed to flow, and even if it spurts there is no danger because it indicates a rather high pressure.

One of the things learned is the desirability of removing as much fluid as possible before administering the serum. In order to do this he found that in conscious patients some mental task, such a simple measure as having the patient count to 100, distinctly increased the flow. This was discovered by Scovern, and it was found to be exceedingly useful. Cobb administered a small amount of chloroform for this purpose, believing that the relaxation of the muscles in the back of the neck also favored the flow. The counting method of course is much simpler.

As soon as the fluid ceases to flow the serum is introduced. This can be done in a variety of ways, either by simple gravity or slipping a rubber tube over the end of a needle having a funnel cylindrical in shape on the end, into which the serum is poured. The method he employed was to use a Luer syringe and allow the weight of the piston to force in the fluid. Usually the injection should be made very slowly, from 1 to 2 Cc. per minute. On a graduated syringe barrel it is very easy to estimate rate of flow. The entire operation usually requires about half an hour. As soon as the serum has been introduced the tube should be removed from the end of the needle, the stylet placed into it and the needle slowly withdrawn. A drop of iodine is then placed on the site of the puncture, and no further dressing is required; indeed, it seems to be a disadvantage to use collodion. It is astonishing how well the skin in the lumbar region withstands repeated punctures. Twenty or thirty was no unusual number and no harm of any kind resulted. The only danger in the administration of serum, providing it was a good serum, was anaphylaxis. The ordinary desensitizing dose, as it is called, of 1 Cc. of serum injected subcutaneously one hour before puncture is made has proven to be an adequate precaution. If there is evidence of anaphylaxis, such as the appearance of a swelling, it is desirable to give a few more subcutaneous doses, increasing in size at intervals of one hour. As a general rule the anaphylactic shock from intrathecal administration of serum even in susceptible individuals is far less severe than it is when intravenous administration is employed.

Since 1899 when Gwyn succeeded in culturing the meningococcus from the blood serum, the question of a possible general meningococcus sepsis has excited some speculation. Herrick called particular attention to the importance of this condition and laid great stress on the desirability of simultaneous intravenous administration of the serum. In the midst of an epidemic he was able to recognize not infrequently the clinical signs of this sepsis, which he believes usually precedes the development of the meningitis, and it is his belief that in many of the cases the microörganism, even if it is not obtained in the blood culture, is circulated in the blood. He therefore adopted the intravenous administration as a routine measure. The technique does not differ in any respect from that of the administration of the antipneumococcic or antistreptococcic sera. The desensitizing dose is given, and one hour later, if there has been no reaction, the intravenous administration is commenced. He lays great stress on the importance of giving the

serum at first very slowly, at the rate of 1 Cc. per minute until 15 Cc. have been given. If there are no manifestations of anaphylactic shock the remainder can be given more rapidly. He usually gives from 50 to 100 Cc. two or three times in the first twenty-four hours.

There has been a good deal of argument pro and con on the advantage of intravenous administration. The majority of authorities believe that the meningococcus circulates in the blood simply as a saprophyte without producing clinical symptoms, although it is known that sometimes it may give rise to local lesions; that the serum in all probability does not pass from the blood to the subarachnoid space as it has been demonstrated that the flow of cerebrospinal fluid is outward into the blood stream and not inward from the blood stream; that, therefore, the serum can have little effect on the meningeal infection, which, as we know, in the great majority of cases is the serious manifestation. Against this it may be argued that evidence at the present time indicates that the infection takes place in the meninges from the blood, and that moreover, if the meningococci are in the blood and can be destroyed there, the infection of the meninges might possibly be aborted; or, if the serum were given in the premeningitic stage, rendered milder; if given later, the administration of the serum being a relatively harmless procedure, the only objection to using it would be the discomfort caused to the patient, and this is slight. Sailer's own experience with the intravenous administration of the serum always combined with the intrathecal administration did not impress him with its value. In those cases in which it was used the course seemed no milder nor briefer than in those in which it was omitted.

Herrick, on the other hand, has published careful statistics showing that in his hands the mortality was distinctly reduced. Statistics of treatment in meningitis are always, of course, liable to error. The great variation in the mortality in the course of an epidemic, even in cases treated by identically the same methods, or, as the older records show, not treated at all, makes conservatism in their interpretation necessary; but he would not hesitate to use serum intravenously in all severe cases.

It is not necessary to do more than mention briefly the other methods of treatment that have been suggested. Repeated spinal puncture without injection of serum has been lauded, but probably has been of advantage only in epidemics in which the serum used was of little value. The introduction of other substances, such as permanganate, lysol, etc., has been shown to be useless and according to Flexner distinctly harmful. The administration of hexamethylenamine by the mouth in large doses with the idea that it might be broken up in the spinal fluid with the liberation of formaldehyde seems to be disproved by the fact that the spinal fluid is practically never acid. The employment of the serum of convalescent patients has been tried, but is subject to all the disadvantages of this method of treatment in other diseases and seems to have led to very doubtful results. The autoserous treatment—that is, the removal of blood from the patient, its clotting, and then the injection of the serum into the spinal canal—has also been tried, but the results are not encouraging.

One of the dangers of the serum therapy is the mistake of an attack of serum sickness for a recrudescence of the disease. If at this time serum is injected a severe anaphylactic shock usually ensues.

The differential diagnosis is not easily made because in meningitis a serum sickness often produces distinct meningitis signs. The fact that it occurs about six days after the last injection, and particularly the fact that during the serum sickness the spinal fluid contains sugar, and that during actual meningitis sugar is almost invariably absent, will, however, serve to render mistakes less common. The test for sugar is simple, the ordinary Fehling solution, and can be made readily at the bedside. It should in any event be made within a short time after the withdrawal of the spinal fluid as it soon disappears.

ACUTE OTITIS MEDIA AND ACUTE MASTOIDITIS.

In the *Illinois Medical Journal* for February, 1920, TIVNEN states a reasonable doubt often arises as to the wisdom of instituting an immediate operative procedure on the mastoid. The paramount desire to save the patient unnecessary operation justifies a resort to abortive measures in all such cases in which operation on the mastoid is not clearly indicated. It is important to recognize that a mastoiditis, secondary to a middle-ear suppuration caused by influenza, diphtheria, scarlet fever, tuberculosis, or syphilis, rarely is amenable to abortive measures, but usually requires the mastoid operation. The abortive measures comprise: free drainage, local depletion, application of cold, rest, regulation of diet, and attention to the bowels. Free drainage is best secured by an early free incision of the drum membrane. Puncturing with a spear-shaped instrument is practically worthless; the small opening thus produced closes quickly and fails to provide the avenue necessary for free drainage. A free incision over the most bulging portion or in the posterior half of the drumhead, extending along the posterior border of the drum from a point opposite the stapes to the lowest point of the membrane, should be done. To this is often added a prolongation of the incision above and outward along the superoposterior wall of the canal, a distance of one-quarter of an inch. Irrigation of the external canal with one-to-five-thousand bichloride solution should precede the operation. A general anesthetic, nitrous oxide or ether, is necessary in children or very nervous individuals. Instilling a few drops of a mixture containing cocaine hydrochlorate 5 to 10 grains, alcohol 1 drachm, anilin oil 1 drachm, is a favorite local anesthetic. In the author's experience an early and free incision of the drum has proven most effective in checking the acute middle-ear infection and preventing mastoid involvement. In his opinion it must be done early to produce a decisive result, particularly in infants and children.

Bulging of the drum membrane is relatively a late symptom of middle-ear suppuration, and one should not wait until it has appeared before deciding to incise the membrane. In all suspicious cases the most effective endeavors at prevention will be attained by a prompt free and early incision. It is often necessary to repeat the incision should symptoms of retention appear. After incision, irrigation with various warm antiseptic solutions (boric acid, saturated solution; normal salt solution; bichloride solution, one to five thousand) are used with the twofold purpose of promoting drainage and destroying the microorganisms. After each irrigation the external canal, if possible, should be dried to its farthest depth with a cotton-tipped applicator, and a strip of gauze (boric or plain) inserted, not packed, to the depth of the drum membrane. Under no circumstances should the various combinations of sweet oil, glycerin, or powders, etc., be used in the ear at this particular stage. In children, especially, the introduction of laudanum or cocaine "ear drops" is liable to produce toxic symptoms. Recognizing that a suppurative otitis media, upon which a mastoid involvement usually depends, is consequent upon an extension of infective processes from the nose, throat, or nasopharynx, it is of importance that proper therapeutic measures be directed throughout the treatment to the relief of these contributory conditions. An important consideration, also, is the necessity of providing complete physiologic rest for the patient during the treatment.

In the early stages local depletion is advocated enthusiastically by some, while others, notably Dench, consider it worthless. In the adult it is necessary to remove considerable blood, about four ounces. The tip and antrum are the chief sites for the application.

Bier's hyperemic treatment is seldom used, has not met with general favor, and its therapeutic value in acute mastoiditis is doubtful.

The application of cold may prove serviceable in the early or hyperemic stage.

The methods of application are the ice-bag and Leiter coil. Politzer states that if the cold eases the pain, the continuation of the inflammation may be assumed; if it proves irritating and unpleasant, the disappearance of the inflammation is probable.

The patient should be put to bed and calomel in broken doses or a saline administered. The diet should be light, preferably milk. Only exceptionally should morphine and similar remedies be employed, as the relief they produce tends to mask the symptoms.

Counter-irritation, as painting the mastoid with tincture of iodine, applying a blister, application of ointments of mercury and silver and the Wilde incision, are mentioned to be condemned. The chief objection to the majority of these is that the consequent soreness they produce adds an additional handicap in estimating the degree and progress of the local tenderness; while the therapeutic value of the remainder is open to question. The value of the Wilde incision is dismissed by Whiting in the following emphatic language: "Its performance at the present day is a senseless proceeding, for the reason that it is not calculated to reach the sources of the disease." Some authors claim, however, that a subperiosteal abscess, in infants and children, may originate beneath the periosteum of the meatus with no perforation of the cortex, and that in these types a Wilde incision is serviceable.

The author has for some time practiced the following routine measures in the management of cases of suspected acute mastoiditis in the early stages consequent upon middle-ear suppurations: (1) The patient is placed in bed, preferably in a hospital, and absolute quiet insisted upon. (2) Calomel is administered, in quarter-grain doses, followed by a saline enema. (3) Light diet. (4) If drainage through external ear is not satisfactory a free incision of drum is made and a gauze drain inserted. (5) Irrigation with hot normal salt solution, a pint every two hours. (6) A thin sterile dressing is applied over the external meatus and secured by one turn of a roller bandage; this insures surgical cleanliness, and prevents discharge from contaminating the pillow and patient. Fresh dressing is applied after each irrigation. (7) To prevent a dermatitis, zinc oxide ointment is applied to the external canal and auricle. (8) Ice-bag or Leiter coil to mastoid region continuously for twenty-four to thirty-six hours. (9) Temperature and pulse taken every two hours. (10) Bacteriological examinations of aural discharge and blood examination made at once and repeated as often as indications suggest. (11) Roentgenograms of suspected and of healthy mastoid, repeated as often as thought necessary. (12) Attention to nose and throat by spray, gargle, or local application.

TRAUMATIC RUPTURE OF INTESTINE WITHOUT EXTERNAL INJURY.

HERZFELD, in the *Lancet* of February 14, 1920, states that the early diagnosis of these cases is often very difficult. The immediate signs of ruptured bowel are practically *nil*. Pain, tenderness, vomiting, flank and liver dulness are signs which tend to confuse rather than clarify the issue. Especially is this the case where the lower thorax has been crushed as well. The pulse-rate and abdominal rigidity are of little value as early signs, but a rising pulse-rate and increasing rigidity call for immediate operation.

When in doubt it is probably wise to operate. The surgeon's point of view should surely not be "Is there evidence of ruptured intestine?" but "Is there sufficient evidence to justify exploration?"

If peritonitis with its concomitant distention, etc., is established, the operation follows the usual lines for that condition; in an early case, however, it is, he thinks, most important to begin with a sufficiently long incision; a small incision which subsequently has to be enlarged leads to waste of valuable time and maybe to faulty procedure. He makes a paramedian incision, choosing the side according to the history or symptoms, and makes it long enough to allow of a preliminary inspection before

manipulation. Inspection often reveals the location of the injury and allows of adequate packing before disturbance of the abdominal contents. If, however, the first opening of the peritoneum is a mere nick, a careful watch can be kept for escape of gas; the abdominal wall should not be drawn forcibly forward at the moment of incision, as in an ordinary case, but allowed to lie naturally, while a small fold of peritoneum is lifted with forceps and nicked; otherwise one may be deceived by the inrush of air.

A resection should not, he thinks, be necessary; he has found the best procedure to be a lateral anastomosis between two separate tears, with, if need be, approximation of the loop. The peritoneal cavity should not be flushed out, but gently cleansed by wiping. When drainage is indicated the pelvis may be drained by a suprapubic stab, and one or other kidney pouch, but drainage should be avoided if possible.

The closure of the abdomen with through-and-through sutures of silkworm-gut is especially important where the patient's general condition is bad. Wounds so closed appear to be no more liable to ventral herniæ than where suturing in layers has been done.

The chief points in the after-treatment of his cases have been the Fowler position, Murphy drip, and Lane's cannulæ in the axillæ.

THE DEVELOPMENT OF INFANTILE UTERI BY NEGATIVE GALVANISM.

HIRST, in the *American Journal of Electrotherapeutics and Radiology* for January, 1920, states that the method of treatment which he has adopted during the last twelve or fifteen years is as follows:

A copper electrode is inserted in the uterus with the necessary aseptic precautions. A large sponge electrode is placed over the abdomen; the patient is then given galvanism with the negative pole in the uterus, nine to twelve milliamperes. This is followed by rapid and slow faradism, finally by the sinusoidal current, the treatment continuing for twenty minutes, and being applied every other day, intermitted in case the menstruation occurs, but otherwise continued for about three months. He has never seen any result except once, secured by less than six weeks' treatment, but he is not satisfied that the patient gets a full result from the treatment under three months. So far as he has seen no infection of the endometrium or of the appendages follows this treatment, but naturally the greatest care in aseptic technique is necessary.

In case the cervical canal is too narrow to admit one of the copper-tipped electrodes made for intrauterine use, he employs a narrow flexible platinum electrode which is practically indestructible. He has had one in constant use for about ten years without any deterioration. Another result of this treatment is the permanent enlargement of the cervical canal by electrolysis, so that the dysmenorrhea which is an almost constant accompaniment of the lack of physical development is usually permanently cured. Another curious result which is secured incidentally is the cure of chronic constipation. After a number of experiences of this kind he feels that the best treatment for the permanent cure of constipation in women if exaggerated and resisting ordinary methods of treatment is the application of electrical stimulation to the abdomen by means of a large abdominal sponge pad, the other pole being placed either in the uterus, the rectum, or simply in the vagina. In the latter case a larger bulb electrode is employed.

In view of the demonstrated possibilities of this treatment it seems strange that it should be ignored by most gynecologists. There was a prejudice excited among specialists in the treatment of diseases of women by the immoderate claims made in behalf of electrotherapeutics for the female pelvic organs when this method of treatment first came into vogue, so that there was a disposition to regard it with some degree of skepticism, not to say ridicule. While it is true that the immoderate claims which were made for electricity in many of the affections peculiar to women were un-

justified in fact, there is no doubt at all that for this one condition it remains the most available last resort and can be expected to secure results when other methods of treatment have failed.

This is what one might logically expect. There would be no hesitancy in applying electrical stimulation to ill developed or wasted muscles in any other part of the body.

Hirst hopes to see in the future a wider application of this method at the hands of many specialists, so that a collective experience will demonstrate to the profession what his individual experience has taught.

THE EFFECT OF PYLORIC OBSTRUCTION IN RELATION TO GASTRIC TETANY.

MacCallum, Lintz, Vermilye, Leggett and Boas (*Bulletin of the Johns Hopkins Hospital,* January, 1920) observe that the nature of gastric tetany has long been a matter of interest, and the theories already advanced to account for it are quite unsatisfactory. According to one it is due to desiccation of the tissues, whereas another ascribes it to the absorption of toxic materials from the stagnating contents of the dilated stomach. It is known that if a communication be established between the stomach and the intestine by a gastroenterostomy, so that the contents of the stomach can once more pass into the intestine, the symptoms disappear at once.

It was observed long since (MacCallum) that when the pylorus was completely obstructed and the stomach frequently washed out, an animal wasted rapidly and died in a few days, usually with violent convulsions which were not precisely of the same character as the twitchings seen in parathyroid tetany.

Pyloric obstruction was obtained by cutting through the stomach just above the pylorus and closing it off with sutures so that it becomes a blind sac on the end of the esophagus. The pyloric end with the duodenum was then brought into the abdominal wound and sutured there. Through it food and water were given, but in the later experiments, in order to eliminate all intake of chlorides and to prevent loss of bile and intestinal contents, this opening was closed except for a tube through which distilled water was introduced. The food which could be given in this way always contained chlorides, and when it was given the symptoms following pyloric obstruction appeared only slowly so that the animal lived about a week. When nothing but water was given, convulsions appeared in about forty-eight hours and death soon followed. Such a result could not be due to starvation, because a dog will live a long time without food.

Estimation of the chlorides in the stomach washings shows that a considerable amount is lost to the body, and this must be sufficient, in the absence of any intake, to lower the chlorides of the body rapidly. Indeed it is difficult to devise any other way in which such an abstraction of chlorides could be attained, since the tissues ordinarily hold tenaciously to their chloride content when the intake is decreased. It seems that the gastric mucosa can still exercise its function of secreting hydrochloric acid even when the plasma chlorides are diminished.

As the result of a carefully conducted group of experiments they conclude that when the pylorus is obstructed and the gastric juice with its hydrochloric acid is constantly removed, there ensues a decrease in the chlorine of the plasma.

There is a consequent increase in the alkali reserve which becomes extreme.

The electrical excitability of the nerves is in general heightened and there are spontaneous twitchings and in most cases violent convulsions which lead to death.

All of this can be prevented by constantly furnishing a large supply of chlorides. It is less easy to cure the condition by the administration of chlorides.

The convulsive movements are not exactly like the twitchings of the tetany of parathyroidectomy in which they have found no heightened alkali reserve, but they can be produced by the injection of sodium carbonate or bicarbonate.

Since these convulsions can be stopped or prevented by sodium chloride, it remains a problem as to what becomes of the excessive base sodium and as to the specific need of the chlorine ion. Further experiments are contemplated to settle these points.

INTESTINAL DRAINAGE FOR INTESTINAL OBSTRUCTION.

VANDEN BERG (*Journal of the Michigan State Medical Society,* February, 1920) calls attention to the fact that simply relieving the obstruction, and allowing the highly infectious and toxic fluid that has accumulated to pass down into the healthy and thirsty distal intestine, is too often overwhelming to the patient.

The value of drainage as a life-saving measure is now regarded as a fundamental principle in surgery. From the therapeutic point of view the most important consideration in obstruction is drainage and gastric lavage if there be regurgitation, and a technique that is simple in its application and in which all soiling is prevented is called for.

Moynihan's technique is mentioned and the following modification described: First of all collapse a knuckle of gut by letting out the gas through a hypodermic needle, and then with the fingers strip down on the gut to empty it of its fluid contents. This latter procedure is less important than the former. The collapsed loop is then grasped with a rubber-tubing-covered forceps to prevent any rushing out of any of the gut contents. A purse-string suture is then stitched in the wall opposite the mesentery, and a longitudinal opening made just large enough to admit the tube. As soon as the tube has been introduced beyond the tip the purse-string is pulled up by the assistant and the clamp is removed. The tube is then pushed into the gut up to the flange, and then as much of the gut as possible is pushed onto the tube. This procedure is repeated in the opposite direction. In acute cases several feet of intestine can be negotiated in this way; in chronic obstruction with hypertrophied walls obviously much less. If there is still unloaded gut that cannot be pushed onto the tube, the gut can sometimes be held up and its contents allowed to run out. In doing this, care must be exercised not to pull on the mesentery. Vanden Berg is now using a tube nine inches in length with a half-inch lumen, which has a distinct advantage in negotiating more gut. It is seldom necessary to make more than one opening.

Throughout the drainage part of the procedure the assistant holds on to the purse-string, in order that it may not loosen with resulting escape of intestinal contents. In withdrawing the tube special attention must be given to lowering the drainage mechanism so that the tip forms the highest point while the purse-string is being drawn down over it. The object of this is that any fluid left in the tube may gravitate away from the bowel. The free edges are carefully wiped with a sponge and alcohol applied. Then it is reënforced with a running suture in the transverse direction.

The gut wall can be so thin from overdistention that it is almost technically impossible to do either an enterotomy or enterostomy, but where it is desirable and possible to do an enterotomy the author recommends the technique as described.

SURGERY OF THE SUPRASPINATUS MUSCLE.

KITCHEN (*Journal of the Michigan State Medical Society,* February, 1920) states that of 100 injuries to the shoulder he has found the insertion of this muscle torn in about 10 cases, as indicated by the separation of the topmost portion of the greater tuberosity of the humerus.

The first case suffered for two months under a physician and then an osteopath. He was an expert plumber, therefore lost largely from his disability. Inspection and palpation showed nothing. The pain was severe on bending the elbow to the horizontal. The *x*-ray showed the separation of the attachment of the supraspinatus to the greater tuberosity.

When one comes to study the anatomy of

the shoulder this looks reasonable enough, because if the supraspinatus hung on hard enough the head of the humerus could hardly slip down enough to get out of the glenoid cavity. The tendon of the supraspinatus hooking under the horn of the spine of the scapula and under the acromioclavicular ligament runs over a sort of steadying, pulley-resisting rotation forward or backward, and is inserted into the topmost facet of the greater tuberosity of the humerus, practically the pivotal point in this most important bone in the most important joint of the human body.

Not only this, but it crosses besides the long head of the biceps as it comes out of the synovial lined sheath in the bicipital groove on its way to its insertion in the upper edge of the glenoid cavity. These two tendons pass each other very closely and are very intimately connected with the capsule of the joint and play a decidedly intricate function in the finer and more delicate movements, such as in swimming and in baseball.

Most of the pain in connection with separation of the insertion of the supraspinatus is due to the irritation of the synovial sheath of the biceps tendon and not due to impinging the fragment against the acromioclavicular ligament, and consequently persistent massage and even the light use of the arm in ordinary duties tend to keep up a painful tenosynovitis and prolong disability.

THE APPLICATION OF RADIUM IN CANCERS OF THE LOWER PORTION OF THE GENITO-URINARY SYSTEM.

SCHMITZ (*Urologic and Cutaneous Review*, February, 1920) holds that a discussion of the clinical value of ray therapy of benign and maligant tumors must be based on the clinical results obtained, the indications for the treatment observed, and the technique employed. Many clinical observations made in the ray treatment of uterine carcinomata apply with equal force to cancers of the urinary system, while the technique employed in the former is of no value in the latter.

Clearly operable cases must be subjected to operation, but should be preceded by such a raying as may cause a degeneration of the tumor cells and a cessation of mitosis. Even should some carcinoma cells be accidentally left behind after operation they probably would be harmless and could not give rise to metastases by way of the lymph or blood-vessels.

Doubtfully operable cases, the border-line cases, should only be treated with radium. A recession of the growth so it is visibly or palpably smaller, or has become clearly limited to the organ, or has even entirely disappeared, does not necessitate a surgical removal. When attempted under these circumstances Schmitz felt convinced of its uselessness. Either the patient succumbed to the operation or the trauma stimulated the tumor cells to a renewed activity. Intensive treatments could not arrest the revived proliferation.

Advanced cancer disease cannot be subjected to ray treatment with any hope of improvement; transitory relief from the symptoms may occur. One must be especially careful in the application of rays in this group of cases. The absorption of the tissue breakdown may cause such a severe autointoxication that the patient with lowered body resistance speedily succumbs to it.

Recurrent cancers should be subjected to excision if it can be safely done. The operation also should be preceded and followed by ray treatment. Otherwise the same rules hold good for recurrent cases as applied to primary border-line and advanced cases.

There were four benign tumors of the urethra, three of which were urethral caruncles that had been repeatedly subjected to operations but always recurred. The fourth case had extensive varices of the entire urethral mucosa characterized by profuse hemorrhages following coitus. Applications of small doses of gamma rays corrected the pathology in each instance.

Seven cases of carinoma of the urethra were subjected to ray therapy. Two of these were clearly operable. In one the growth was excised and radium and Roentgen rays applied afterwards; in the other

the growth, the size of a hazelnut, was located in the middle anterior urethral wall, and only treated with gamma rays. Both patients have remained free of recurrences for three years. Four clearly inoperable and advanced carcinomata were subjected to radium treatments. One has a complete local healing and is well one year and seven months at present writing. One recurrent cancer was treated, which has remained well two years and seven months now.

A recurrent sarcoma of the penis did not respond to treatment; the patient was very reluctant to have anything done for him. Otherwise the result might have been different. The extensive carcinoma has proven refractory to the rays. The author anticipated this result, based on several observations seen in advanced cancers in other organs. The third case also is in an advanced state, hence hopeless.

One case of recurrent sarcoma of the scrotum was subjected to excision and ray therapy. The tumor was the size of a walnut and round-celled. The patient has remained well for more than five years now. Another recurrent sarcoma of the scrotum that invaded the left regional lymph-nodes and kidney did not respond to very intensive Roentgen treatment.

Fourteen patients with prostatic enlargements were treated. A benign hypertrophy has remained well one year and seven months. Seven doubtfully operable carcinomata were subjected to excision and ray therapy, two are well for one year and four months and four months respectively. One doubtfully operable case was treated with rays only, but succumbed to anuria. The four clearly inoperable cases were rayed with radium and Roentgen rays; one has remained free of any recurrence for one year and four months. The one recurrent case was subjected to a combined treatment without any improvement.

One benign pedunculated tumor of the urinary bladder was subjected to desiccation and radium application and is well for nine months. Two border-line carcinomata were treated with operation and radium and one with radium only. Both succumbed. Of the clearly inoperable cancers three were subjected to a combined treatment and died soon after. The other eight were rayed only. Four of these are alive, one four years, one one year and two months, one seven and one six months. They are at present free of any sign of the disease. Three recurrent cases were treated with the combined method without any improvement, while two were rayed. Only one was followed up for three years, during which time he had no recurrence. He is said to be alive and well at present.

The technique of the ray therapy employed in these cases was as follows: Urethral carcinomata were subjected to cross-firing. All these cases were observed in females. A radium capsule of 50 milligrams element was filtered with 1.2 mm. of brass and 31 mm. of Para rubber and placed in the urethra. Another like capsule was inserted into the vagina. The lateral and posterior walls were protected with 5 mm. lead plating and gauze. A dosage of 1000 mgrs. will effectually destroy such a growth. The application should not be repeated within six to eight weeks.

Cases of operable scrotal and prostatic cancers are treated by placing radium capsules in the wound cavity at the time of operation. In the preoperative treatment or in the inoperable cases the radium is carried into the tumor masses by specially constructed trocars. The amount of milligramme hours necessary to cause a complete degeneration depends on the size of the growth. Should the radius of the mass measure two centimeters a twenty-four hours' application of 50 milligramme element is deemed sufficient. This will suffice in the majority of the cases.

Bladder carcinomata should be subjected to a suprapubic cystotomy. The radium can then be placed exactly against the mass. A retention catheter must be inserted through the urethra to keep the bladder empty during the treatment. Ten hour exposures of 50 milligrammes of the element are given. They should be repeated every other day, depending on the size and the extent of the growth. The writer always

objected to the use of cystoscopes provided with special radium carriers, as the treatment to be effectual must be a prolonged one—*i. e.*, ten hours repeated three or four times at intervals of 36 hours. Carcinomata of the posterior wall of the female bladder also were treated with cross-firing through the vagina.

The regional lymph-nodes must always be subjected to a thorough course of Roentgen rays. The intensive homogeneous method is probably the simplest and most effectual. One field of a diameter of 10 inches is used. The focal distance is 50 cm., the filter 1 mm. copper and sole-leather, the milliamperage three, the current 100 kilovolts. The application should last about two hours if a Coolidge tube is used. The dosage thus obtained is about 1.25 E.

THE TREATMENT OF CHRONIC GONORRHEAL RHEUMATISM.

FRASER and DUNCAN (*Lancet,* January 31, 1920) point out that in the gonorrheal patients in a military hospital a relapse of malaria, with a hyperpyrexia and the parasites demonstrable in the blood, dries up the urethral discharge very quickly, much faster than ordinary treatment measures. Usually the discharge reappears shortly after the subsidence of the fever, but Culver has described a case of acute gonococcal urethritis which was cured spontaneously by a malarial relapse lasting four days.

During the influenza epidemic last winter some cases of chronic gonorrheal arthritis became victims. These cases had been bedridden for months, and were showing no response to treatment, in spite of the fact that all the most hopeful lines had been tried on them.

During and for some time after the influenzal pyrexia there was a marked lessening of the arthritic pains in these patients, and some freedom of movement in the affected joints resulted.

It is fairly well known in India that the more elderly natives submit to plague inoculation not from dread of plague nor faith in the vaccine, but because experience has taught them that it eases their rheumatism. Rolly and Meltzer, Lüdke, and numerous other workers found that a temperature of 104° to 107°F., artificially produced, had a favorable influence on an established infection. Heated animals were more resistant to injections of bacteria, and agglutinins and bacteriolytic substances were produced more abundantly in animals which were kept overheated. The heat may damage the infecting organism or it may cause a more rapid and firm union of antigen and immune body.

Petersen and Jobling, using experimental animals, injected intravenously such substances as bacteria, kaolin, protein-split products, and trypsin, and found that almost invariably the injections were followed by an increase of serum, proteose, and lipase. They found similar reactions in patients after intravenous injections of vaccines and of proteoses, though to a less degree and with less regularity than in animals. They observed improvement in cases of established infection following such injections, and suggested that the ferments might digest the microbes and their toxins.

The author reports a number of cases which seem to prove his contention. He considers the following as the most noteworthy points of his paper:

The marked improvement in all cases.

That no benefit seemed to result from an injection that was not followed by pyrexia.

Though the temperature rose there was no change of any importance in the pulse-rate nor any other untoward symptom. At the time treatment was commenced the patients were extremely debilitated with a rather fast and weak pulse, which was easily accelerated.

The injections were all intravenous. There was no appearance of a clinical negative phase. The vaccines used were not freshly prepared. As a result of storing, probably the toxins contained had broken down more or less.

The injection of these, possibly, non-specific germ constituents would seem to

have caused the production of specific antibodies.

The size of the doses used. These compare favorably with the doses recommended by Thomson for his detoxicated vaccines. The doses of pus vaccines used by Pineo and Baillie seldom exceed 72 millions given subcutaneously and never exceed 150 millions. The largest dose of gonococci used by the authors was 2000 millions.

CEREBROSPINAL FEVER IN INFANTS AND YOUNG CHILDREN.

MACKAY (*Lancet*, Jan. 31, 1920) reports eight cases of cerebrospinal meningitis in children under eight years of age occurring between September, 1916, and July, 1917.

All these patients were treated by repeated lumbar puncture and the intrathecal injection of polyvalent antimeningococcal serum prepared by the Lister Institute. A general anesthetic was rarely administered. There was not a single death, though some were very severe chronic cases of the posterior basic type.

The plan followed, speaking generally, was to continue the administration of serum daily until no meningococcus could either be found in direct films or grown in culture from the cerebrospinal fluid, and to continue lumbar puncture as long as the intrathecal pressure remained excessive. The dose of serum given varied according to the quantity of fluid withdrawn and the intrathecal pressure. As much as 20 Cc. was given, in a single dose, to an infant of four months.

Before the introduction of serum treatment the mortality in infants ranged, according to Flexner, from 90 to 100 per cent; whereas F. E. Batten gives the following figures for endemic posterior basic meningitis in London: "Fifteen per cent recover completely; 35 per cent survive, but exhibit some permanent defect, either mental impairment, hemiplegia, diplegia or blindness; while the remaining 50 per cent prove fatal."

Dr. Josephine Neal, in a series of 76 children under one year treated with serum, had a mortality of 50 per cent. Others record a mortality of from 48.6 to 64.2 per cent.

An adult who recovers seldom shows any permanent after-effects of the illness, but it is otherwise in young children, partly because they so frequently come under treatment late in the disease on account of the most uncommon insidious onset and the difficulty in diagnosis, and partly because in their case the cranial capacity is not a fixed quantity, and therefore the increase in pressure is more gradual than in the adult.

The author states that no matter how hopeless a chronic case of cerebrospinal meningitis may seem, the patient may with adequate treatment make a complete, or almost complete, recovery. So far as can be judged at present, all the children described above should develop into useful members of society. The author ascribes these good results largely to the continuance of lumbar puncture as long as the intrathecal pressure remained excessive.

To summarize results. Of the eight cases, five are now healthy, well-developed children with normal mental faculties, although two suffer from a disability—*i.e.*, deafness and strabismus, stated by the mother to date from the meningitis. As an indication of the severity of the disease, as late as the forty-eighth day he was still semistuporous and unable to sit up. The same point is illustrated in another case and the fact that he required nasal feeding for over six weeks. Another was also a severe chronic case, but in that instance the intrathecal pressure was never high.

The three remaining patients are mentally backward, but it is difficult to say to what extent this is due to the rachitic condition from which they have all suffered. In another case both the physical and mental backwardness may be wholly ascribed to rickets, whereas both diseases were probably factors in the production of the present mental condition of the other two cases. In one case treatment was not begun until the twenty-third day, the child was unable to swallow for over three weeks, and at the end of five months in hospital he appeared

demented; yet now the only after-affects are some backwardness, adiposity, and a very slight localised muscular weakness, probably the result of disuse. In another case there was internal hydrocephalus and 21 ventricular punctures were performed, but the only after-effects apparent are some backwardness and strabismus.

PSEUDO-ASCITES.

JOHANNESSEN (*Norsk Mag. for Lægevidenskaben,* September, 1919) records a case conforming to the type defined in 1904 by Tobler. The patient was a girl, aged seven years, who had suffered for the past three years from progressive abdominal distention, attacks of gastric pain and borborygmi, bulky, loose, and frequent motions, emaciation, and anemia. She had been treated elsewhere for peritonitis. On her admission to the author's hospital, with the diagnosis of megacolon congenitum, she presented at first sight the characteristic picture of peritonitis with effusion. The skin over the much distended abdomen was tense and shining, the umbilical depression was obliterated, the superficial veins were clearly outlined, fluctuation was easily demonstrable; splashing sounds, loudest over the right iliac fossa, could be heard, and dulness could be demonstrated in the flanks and above the symphysis, shifting with changes of position. But when the percussed finger was gently and steadily pushed into the dull area, the percussion note became tympanitic owing to the displacement of fluid-containing intestine. The motions were fermenting and offensive, and the patient, who had been a bright child, was apathetic and sallow.

Suspecting that all the symptoms might be traced to a chronic fermentative process in the intestine, the author prescribed an antifermentative diet and kept the patient much in bed. The fact that, when the intestines were emptied by oil and enemata, the circumference of the abdomen at the level of the umbilicus shrank from 61 to 49 cm., while the area of dulness became smaller, confirmed his suspicions as to the non-existence of free fluid in the peritoneal cavity. The absence of fever, except when oil and enemata were given, and a negative reaction to diagnostic injections of tuberculin, further invalidate the diagnosis of tuberculous peritonitis. She improved rapidly under treatment, and after she had been eight months in hospital the general condition was completely altered. She had gained 10 pounds, ate voraciously, was lively, her hair and skin had lost their lusterless appearance, and the motions were practically normal. Fluctuation was not demonstrable, but the abdomen remained boggy, and dulness, shifting daily in outline and area, could still be demonstrated; she was also markedly pot-bellied when she stood up.

The similarity of this case to the four reported by Tobler, in which the absence of ascites was demonstrated by laparotomy, also points to the correctness of the diagnosis—pseudo-ascites. The series of events leading to this condition were: unsuitable feeding, chronic catarrh of the digestive tract, atony of the gut which excreted too much and absorbed too little, fermentation of the food, distention and sagging of the gut with elongation of its mesentery—a vicious circle best combated by careful dieting and much rest in bed.—*British Medical Journal,* Nov. 1, 1919.

SPINAL CORD TUMORS.

ELSBERG (*American Journal of Medical Sciences,* February, 1920) reports of 31 extramedullary tumors of the cord 29 recoveries and 12 deaths; of 11 cauda equina tumors 9 recoveries and 2 deaths; of 7 extramedullary tumors 6 recoveries and 1 death; and of 18 intramedullary tumors 16 recoveries and 2 deaths. Of the last 200 laminectomies performed by the writer, 12 cases ended fatally, a mortality rate of 6 per cent. The mortality of the operation of laminectomy and removal of the spinal cord tumors should not be large. Of 67 patients in the author's series, 7, or 10.4 per cent, died after the operative interference; in the

operations for extramedullary tumors there was a mortality of 6 per cent.

Two patients with extramedullary cord tumors died four days after the removal of the tumor; an old diabetic (sugar-free before the operation) died on the fourth day in diabetic coma; the other patient was a very stout woman, aged sixty-four years, who succumbed to an ether pneumonia on the fourth day after the operation. Two patients with tumors of the conus and cauda equina died—one of them five days after operation from necrosis of the wound and sepsis, the other four days after the surgical interference in coma with a hemorrhagic nephritis. The fifth patient was a child of four years, with a large extradural sarcoma which was found to be an extension of a large malignant growth of the right chest. The patient died in shock twenty-four hours after the removal of the growth in the spinal canal. The sixth and seventh patients had high cervical intramedullary tumors. One patient had an intramedullary infiltrating glioma in the upper cervical cord that was an extension downward of a tumor in the posterior cranial fossa. The growth could not be removed, and death occurred on the third day from respiratory paralysis. The other patient was a woman with respiratory and cardiac symptoms from a localized intramedullary tumor of the third to fifth cervical segments.

THE TREATMENT OF CARRIERS OF DIPHTHERIA.

Professor Arloing (*The Practitioner*, February, 1920; and *Journ. de Méd. et de Chir. Prat.*, Oct. 10, 1919) observed that the serum treatment of diphtheria has been made more effective by the introduction of a serum which is both antitoxic and bactericidal for the diphtheria bacillus. It is obtained by injecting into the horse the diphtheria toxin and the bacilli together. By use of this the bacilli present in the pharynx and on the tonsils can be reached by making the patient swallow tablets prepared with this serum, or better still by insufflation of the throat with dried serum, well powdered, mixed with an inert powder and with gum tragacanth, in order to increase its adhesion to the mucous membrane and thus insuring a longer contact with the bacilli to be destroyed. The insufflations are made three or four times a day between meals, after the patient has gargled with some antiseptic lotion. In three weeks, very often in less, the diphtheria bacilli will be found to have disappeared from the throat. The procedure is quite simple and causes no pain. The bacteriological examinations of the throat should be made after giving the insufflations, the second to be taken a week after the first.

INTRACARDIAL INJECTIONS.

Early in the present year von den Velden published an account of the technique and indications for cardiac puncture and the injection of drugs into the cavity of the heart. Recently two further papers have appeared (*Münch. med. Woch.*, May 23, 1919), one by Hesse of Halle, the other by Zuntz of Hamburg. The latter records an interesting example of intracardial injection as a life-saving measure. A woman of fifty-six, feeble and emaciated, had had a resection of the cecum and ascending colon for carcinoma. When the intestines were returned to the abdominal cavity the patient collapsed and no trace of a pulse could be felt. Artificial respiration and subcutaneous injection of camphor were of no avail. After four or five minutes, during which heart massage was tried (by what method is not stated), intracardial injection was performed as a last resource, a puncture with a long needle was made three fingerbreadths to the left of the sternal edge in the fourth intercostal space, the point of the needle being directed toward the midline. One cubic centimeter of adrenalin was now injected. Zuntz remarks: "Whether I had made the injection into the musculature of the right ventricle, or whether into the ventricular cavity, I do not know." In half a minute the carotid could be seen beating again and spontaneous respiration was resumed. Surprise may be

felt that the needle entered the right ventricle and not the left, but the obliquity of the heart is such that but little of the left ventricle presents, and it is not easy to inject unless dilated. Hesse dwells on the technique of puncture from the therapeutic aspect and gives the details of puncture sites. He prefers to withdraw a little blood into the syringe to make certain that the needle is in the ventricular cavity before he makes his injection. The drugs employed include strophanthin, digipurin, caffeine, camphorol, etc. Szubinski has apparently tried this form of therapy on the severely wounded in battle, but only one man lived as long as ten hours after. The method seems to be perfectly safe. Hesse has himself done it on twelve patients.—*British Medical Journal,* Nov. 1, 1919.

THE USE OF PROPYL ALCOHOL AND SOLUTIONS OF CERTAIN DYESTUFFS IN PROPYL ALCOHOL IN SURGICAL THERAPEUTICS.

PLETH *(American Journal of Surgery,* January, 1920) calls attention to the hydrating action of alcohol in general. Thus wood alcohol (methyl alcohol) combines with two molecules of water; grain (ethyl) alcohol with four; propyl alcohol with eight; butyl alcohol with sixteen; amyl alcohol with thirty-two, etc. Up to date only ethyl alcohol has been used in surgical technique and principally as a disinfectant of the hands (Ahlfeld). Its albumin-precipitating properties are well known, and Beyer thinks that its therapeutic action depends upon its poisonous properties, but that its poisonous property is counteracted by the hygroscopic property of the alcohol. The precipitation by alcohols of albuminous materials depends upon the presence of salt (Fischer), and, when alcohol acts upon bacteria (in watery medium), it causes a precipitation in the bacterium and thus kills it.

Tests have proved that 16-per-cent propyl alcohol kills bacteria quicker than 24-per-cent ethyl alcohol or 32-per-cent methyl alcohol, but there is another factor that determines the killing action, and that is the surface tension of the alcohol in question. Traube and Czapek have shown that in undiluted conditions the surface tension is very low, and if it is added to water the surface tension of this is much reduced. All questions of osmosis and narcosis depend on this surface tension. The surface tension is calculated by means of the usual stalagmometer (either the Traube or the Amann stalagmometer can be used). If the tension of propyl alcohol in water (1 in 3) is equal to 0.4, then the stalagmometer with this mixture yields 240 drops of a 25 per cent propyl alcohol at 15° C., etc.

Czapek has proved that for a number of substances the surface tension must be 0.68 in order to enter into the interior of the living cell and kill it. This question of surface tension is of the utmost importance, as it explains hemolysis according to the investigations of Fuhner and Traube.

The surface tension of the erythrocytes is about 0.6; of the yeast cells about 0.5; and Christiansen calculates that of bacteria to be about 0.4 and that of spores to be about 0.3. The surface tension should be carefully studied where intravenous injections are practiced.

The low number, 0.3, explains why alcohol does not kill spores even by long contact.

Wirgin draws the conclusion that propyl alcohol is the deepest acting and that no kind of alcohol exercises disinfecting activity on a dry object in undiluted condition. Christiansen has shown that at 25° C. the time consumed for disinfection is one-half minute with a surface tension of 0.45 for methyl alcohol; with 0.43 for ethyl alcohol (acetone has 0.42).

Of all the alcohols only propyl alcohol disinfects at as low temperature as 0° in a dilution of from 30 to 100 per cent.

The experiments demonstrate that propyl alcohol is admirably adapted for skin disinfection, as it has a low surface tension and can mix easily with water and lipoids; yet its surgical use up to date has been but little utilized. Saul sterilized surgical sponges by boiling them with 30-per-cent propyl alcohol.

Of other investigators over the use of alcohols for sterilizations must be mentioned Buchner, Fuchs, and Wirgin. Concerning propyl alcohol it must be remembered that it loses its disinfecting properties if mixed with more than four times its volume of water (different surface tension coefficient). The value of alcohols depends upon their ability to penetrate the layer of fat on the skin, and in which bacteria are found, and their ability at the same time to kill the bacteria, all of which, as already said, depends upon a low surface tension and great ability to combine with water and lipoids. Fifty-per-cent propyl alcohol is thus a better cleanser of the skin than a 2-per-cent solution of silver nitrate.

Ethyl alcohol has been used extensively in surgery, and its best action seems to come from a 70-per-cent solution, but if diluted with the natural fluids in a wound it loses its penetrating properties, and if used in higher concentration than 70 per cent it is painful and precipitates the albuminous substances.

SPINAL ANESTHESIA.

PAUCHET *(American Journal of Surgery,* January, 1920) notes that there are two convenient methods of anesthesia, namely, rectal anesthesia, with oil-ether mixture, and spinal anesthesia. The former is not applicable to abdominal operations since it distends the intestines. The latter is particularly serviceable under such circumstances because it contracts the intestines. The author uses cocaine with novocaine. He believes that spinal anesthesia is indicated in major operations on the abdomen, pelvis, and lower extremities (amputation, disarticulation, resection of the knee, of the hip, of the thigh, high extirpation of the rectum, hysterectomy for cancer, gastrectomy for adherent ulcer, intestinal obstruction, etc.) In the last condition (intestinal obstruction) spinal anesthesia improves the prognosis because it causes intestinal contraction, relaxes the abdominal wall, and does not endanger the life of the patient from fecal vomiting, a result of narcosis.

It should be employed for simpler operations in which local anesthesia suffices (hemorrhoids, varicocele, perineorrhaphy, amputation of the foot, osteotomy of the femur, prostatectomy, craniotomy, goiter, cancer of the tongue, etc.).

The patient should be lying or seated; in the latter case the back is arched. For high abdominal operations (stomach, liver, kidney) the head and pelvis should be elevated, so that the middle of the back is in a lower position. In the case of an infant, it should be placed in such a position that the head and knees touch, bent like the arc of a circle, whilst the back remains in contact with the table. This position should be maintained for three or four minutes.

Choose an intervertebral space, in the midline, dorsolumbar, lumbosacral, or between lumbar vertebræ. For anesthesia of the upper abdomen, he advises dorsolumbar puncture. For anesthesia of the perineum and lower extremities, lumbosacral puncture. The latter space is large, accessible in the median line, equi-distant from the crests of the ileum and the posterior inferior iliac spines.

How much fluid should be withdrawn? If the tension is low, 10 Cc.; if it is high, withdraw 25 to 30 Cc. into a graduate (LeFilliatre). The first few drops should be permitted to flow into the ampoule containing the anesthetic powder; the powder is mixed and dissolved; if necessary, it may be heated slightly to complete its solution.

For anesthesia of the stomach and liver, use an entire Corbiere ampoule. It contains 6 cgm. of procaine and 3 cgm. of cocaine. The anesthesia ascends to the neck, and lasts an hour and a quarter. The dose should be judged in proportion to the severity of the operation. It should be weaker for the stomach than for the kidney, weaker for the uterus than for the stomach, and still weaker for the thigh, foot, or perineum. In the latter case, with lumbosacral puncture, one-third of an ampoule is sufficient.

Fill the syringe with 3 Cc. of the prepared solution (anesthetic powder dissolved in cerebrospinal fluid). Inject the liquid slowly. Aspirate the cerebrospinal fluid,

reinject and withdraw two or three times so as to complete the diffusion in the spinal canal. Make the patient cough in order to encourage the diffusion of the fluid. The injection should occupy several minutes.

Retention of urine may last several days.

Vomiting is rare after the operation. Should it occur during the operation, apply cold compresses to the neck.

Sciatic neuralgia occurs when puncture is made outside of the median line. It never lasts.

Headache is a frequent occurrence. Give antipyrin. If violent, perform a lumbar puncture. Violent headache is rare with good technique.

Anal incontinence, during the operation. The patient has involuntary defecation. This is troublesome in total abdominal hysterectomy as the feces may get into the vagina. The nurse should be instructed not to give an enema on the morning of the operation, to tampon the vagina, to purge the patient two nights before the operation, instead of the evening before, to give fluid diet from the time of purgation up to the operation.

Asphyxia, from bulbar inhibition. The anesthesia may ascend sufficiently high to paralyze the respiratory center. If the patient is conscious, tell him to blow, or make him talk without stopping. As soon as the puncture is finished, instruct an assistant to tell the patient to breathe deeply for five minutes through the nose. Paraplegia and ocular palsy are rare and only transitory.

Deaths are rare, but may occur as with chloroform. Spinal anesthesia is neither more nor less dangerous than chloroform anesthesia. Patients suffering from shock, or enfeebled by infection, tolerate spinal anesthesia badly.

In conclusion, spinal anesthesia presents some immediate dangers, almost negligible. But it has no untoward action on the lung, liver, or kidneys. It allows severe traumatizing operations to be performed with minimal shock, such as resection of the hip or amputation of the thigh, in wounded soldiers. It lessens the danger of major abdominal operations, because it contracts the intestines, relaxes and quiets the abdominal wall. Hysterectomy for uterine cancer, laparotomy for acute intestinal obstruction, are performed with greater ease and with less danger under spinal anesthesia than under general narcosis.

OPERATIVE TREATMENT OF SEMINAL VESICULITIS.

CUNNINGHAM *(Journal of Urology,* Volume III, No. 4) pays a well-merited tribute to Fuller in pointing to infection of the seminal vesicles as the frequent cause of that toxic condition manifested by crippled joint lesions. He observed that as infections in the prostate and the seminal vesicles produce a somewhat varied clinical picture, they have been divided into four groups for consideration: (1) The inflammatory group; (2) the rheumatic or metastatic arthritic group; (3) the pain group; (4) the neurasthenic group.

In the inflammatory group there is acute suppuration, occurring most often in the seminal vesicles and prostate in the course of acute urethritis, resulting in a febrile state and presenting locally a swollen, tender prostate, and distended, painful seminal vesicles. This condition is generally treated by confinement to bed, local applications and drugs to relieve pain, with the result that after the acute process subsides there persists a urethral discharge from the subacute or chronic seminal vesiculitis and prostatitis, which may last for weeks or months, even with appropriate local treatment.

Under the rheumatic group are included joint, tendon, muscle and bone lesions which may be dependent upon a focal infection. Gonorrheal seminal vesiculitis and prostatitis with metastatic lesions fall into the same class of focal infection as those arising from dental abscesses, tonsillar infections or other poorly drained infective foci, from which other parts of the body become secondarily invaded by emboli or toxins entering the blood stream. In searching for the focus which will explain a so-called rheumatic manifestation much differenti-

ated study may be necessary in some cases; but in the differential diagnosis the condition of the prostate and seminal vesicles should be included.

Under the pain group are included those with persistent perineal pain, sometimes accentuated by defecation and often referred to the rectum. It is indefinite in character, but extremely disturbing to the individual, and is often associated with neurasthenic symptoms, painful erection, without sexual stimulus, frequent nocturnal emissions, sometimes painful, and bloody semen. This group usually gives a history of previous urethritis, and in the absence of rectal or bladder disease and the presence of palpable changes in the prostate and seminal vesicles, associated with abnormal elements in the fluid expressed from those organs, the cause of pain may be attributed to disease in these structures. Changes in the verumontanum may be associated with the changes in the prostate and seminal vesicles, and occasionally treatment of this structure alone may relieve the distressing symptoms.

Under the heading of neurasthenic group are included those with but slight physical findings of disease in the seminal vesicles as already enumerated and mental symptoms in the nature of depression, melancholia, and apprehension, associated especially with sexual features—the so-called sexual neurasthenia.

There have been many cases in the inflammatory group which with acute suppuration in the prostate required drainage; but at the time the acute suppuration in the seminal vesicle was neglected, and the subsequent condition was that of the usual chronic prostatitis and seminal vesiculitis case. The group of acute cases resembling ischiorectal abscesses receiving simple incision and drainage frequently had persistent sinuses, some for long periods, and some required repeated operations and prolonged local treatment by massage, etc., and most were not cured.

The chronic inflammatory group had some patients who showed little or no improvement, and who vacillated from one doctor to another without resulting cure. The majority of the chronic group was made non-infectious, as far as could be determined, and in most of them the process became quiescent, some with and some without remissions of symptoms. This latter group is still to be best treated by non-operative procedures, yet it is felt at present that the persistent cases had best be operated upon to remove the focus from which evidence of suppuration arises. In most of these classes the Belfield operation has proved of benefit, yet the author believes there are some that cannot be cured by any procedure short of thorough drainage or removal of the seminal vesicles and a prostatotomy.

In the rheumatic group non-operative treatment, in the form of fixation, baking, local joint application, massage, local urethral medication and irrigation, together with vaccines, has been of benefit in the milder cases, yet a permanent cure has been rare. The opening and washing of joints added to the usual non-operative treatment has been occasionally beneficial, but on the whole the results have been poor, and such treatment as opening the joints has now been discarded.

In the pain group and the neurasthenic group there has also seemed to be a predominating psychological element. Many have had prostatitis and seminal vesiculitis without a positive gonorrheal infection. Often there has been no history of the gonococcus infection nor could the gonococcus be found, but the abnormal amount of prostatic and seminal vesicle secretion persisted, and staphylococci and B. coli were not infrequently discovered in the secretions. The symptoms in these two groups may be dependent upon disturbances in the deep genital structures, yet most patients have had a queer mental attitude, especially in connection with sex relations; are often poor physical specimens and without physical employment or pleasures. It has been found that most of them suffered from constipation and other indefinite ailments which may be attributed to lack of physical pursuits and play a part in the general disturb-

ances. This group has improved quite as much from a domineering personality and improved general perspective as from any non-operative or operative procedure, except in those patients in whom the deep genital structures gave evidence of a real inflammatory condition.

In the inflammatory group there are 52 cases; 17 of them were of the acute variety, 5 having suppuration of the prostate as well, and 4, besides showing pus in the seminal vesicles and prostate, had a unilateral suppurative epididymitis. There were 5 other cases in which rupture of the seminal vesicle or prostatic suppuration had invaded the ischiorectal fossa. There were 5 cases in which the suppuration was confined to the seminal vesicles.

Fifteen of these 17 cases can be considered cured, and all showed the immediate improvement incident to the evacuation of pus. With the establishment of drainage, pain was relieved, the temperature and leucocytosis dropped, and it remained only to care for the infection in the urethra. The course of these cases following suppuration in the seminal vesicles and prostate leads to the feeling that if such infection of these structures would go on to suppuration whereby all the foci of infection became confluent, a more rapid cure may be expected. Those cases in which the suppuration was in the seminal vesicles alone proved the hardest to cure, as the remaining foci of infection present in the prostate required further treatment, and in two patients the prostate continued to give some evidence of chronic infection for long periods.

Thirty-five of the 52 cases in the inflammatory group were of the chronic variety, having received local treatment over periods of months or years, the process being relatively quiescent at times, to be followed by acute exacerbations without known cause, or from obvious lowering of the local or general resistance. Vaccines which were employed in some of the cases proved of little or no value. The cases forming this group were subjected to operation only after it was evident that the inflammatory lesions could not be drained through the natural channels by the usual methods of non-operative treatment.

There were six patients in this group who had sinuses following a rupture of a suppurative seminal vesiculitis or prostatitis, each giving a history of having had an abscess develop during a gonorrhea and present on the buttock, which was incised. In one of these the sinus led to the seminal vesicle on one side, and in the other five it could not be determined that the sinus did not originate from the prostate. Each of these cases, however, had evidence of both seminal vesiculitis and prostatitis.

Eighteen cases in this group required but little local treatment following operation to effect a cure, and all may be considered greatly improved. In many, nearly all suppurative symptoms disappeared before the operative wound was healed and have had no further discharge. Especially is this true of the cases in which the infection was chiefly in the seminal vesicles.

In the rheumatic group there were 128 cases. Many of these patients had been invalids, periodically, for many years. Some had monarticular affections, while others had multiple joint and tendon affections. Sixteen had so-called spurs of varying types on the under surface of the os calcis or other bones, and when present on the os calcis were bilateral, except in one patient.

Most of the cases had received nearly all known forms of treatment with varying benefit, but none had been cured. As a rule they had a urethral discharge, either acute or chronic; and many who had become relatively free from rheumatic manifestations, or apparently cured, were prone to a return of severe rheumatic symptoms most commonly following a new infection.

Removal or drainage of the seminal vesicles and drainage of the prostate in this group has given the most striking results, and this procedure has changed what was previously a most hopeless condition into one of the most satisfactory and brilliant surgical triumphs. Pain has disappeared from affected joints, following the other recovery in most instances, and even large, swollen joints have often become normal in

appearance within twenty-four to forty-eight hours following operation. While the explanation of this phenomenon is wanting, the facts remain.

Of the 128 cases in the rheumatic group, 18 had destructive intra-articular lesions; 16 had periosteal changes, mostly in the form of spurs on the os calcis, bilateral except in one. All in the former group may be considered greatly improved, and most of them cured, the worst features being slight limitation in joint motion in those with destruction of bone and cartilage, and weakness and some swelling in those with a villous arthritis. All cases with periosteal spurs were cured by the removal of the spurs.

Of the 110 patients without destructive intra-articular lesions, all may be considered cured as far as joint manifestations are concerned.

In the pain group there are 14 cases. This group is the most unsatisfactory in regard to the results. The symptoms had been indefinite in character, associated with neurasthenic features, as mentioned under non-operative treatment. All means of alleviating the symptoms were employed before operation. Transitory improvement by different forms of treatment were not encouraging.

Four of the cases may be considered cured, three improved, and seven unimproved. All of the patients who had discharge were relieved of this feature, and all but one was relieved of pain. On the whole this group of cases has been the most unsatisfactory of all.

ANESTHESIA IN CEREBRAL AND SPINAL SURGERY.

PALERMO *(Medical Record,* Feb. 7, 1920) prefers for cerebral surgery just the simple oxygen tank on the side of which hangs a bottle containing ether. In this way the oxygen becomes saturated with ether vapor, and thence it is carried to the lungs as such through a tube running from the bottle to the mask.

The administration of the anesthetic to these patients is made more difficult because the administrator must remain at the foot of the table so that he may not interfere with the work of the surgeon and his assistants. The patient is draped and is entirely covered, so that little opportunity is afforded the anesthetist to observe the patient; the respiration, pulse, and color of the blood are his only signs. The quantity of ether given is dependent upon the amount of oxygen going through the ether bottle—the more oxygen, the more ether vapor.

Before the administration of ether, if the patients are asked to breathe rapidly and deeply for a few minutes, there is hyperoxygenation of the blood, which seems to lessen and obtund the sensibility; under no circumstance should a patient be forced to take an anesthetic—this is as true for children as for adult patients. Only management is necessary to secure the coöperation of even a very young child; the anesthetist may even himself breathe through the cone and let the patient play with it. In adults there should be some practice in deep breathing deliberately before using the anesthetic with the object of accustoming the respiratory mechanism to take deep breaths by habit even when not entirely under control of the will; and the patient should have the suggestion of this effect frequently repeated in his ear as he "goes under" the anesthetic. The occupation of attention necessary for deep breathing during the taking of the anesthetic lessens the concentration of the mind on the sensations and actually lessens the discomfort. Besides, deep breathing distributes the anesthetic over the lungs, leads to its absorption more rapidly, and makes the irritation of the anesthetic less by diffusing it over a larger surface. On the contrary, short rapid breaths lead to an intensity of the irritation and a much slower absorption.

The anesthetic is started with pure ether, using the Yankauer mask, and after the patient is fairly under its influence the operative area and the patient are draped; the anesthetist now retires to the foot of the table and the ether-oxygen tank is connected.

The patient is kept very slightly under—and in children, usually crying, but relaxed. He is kept this way until the dura is opened, when the narcosis is increased. In brain surgery, from the time the bone is removed (permitting the bulging of the dura), unless the depth of the anesthesia is increased when the dura is incised, and if there is much loss of cerebrospinal fluid or a marked bulging of the brain itself, some reflex condition results, such as a change in respiration, coughing, swallowing, etc.; but this does not occur in the same degree, or as often, if the patient is well anesthetized at this time. As soon as the operator begins to suture the incision, the anesthesia should be lessened and then discontinued when the temporal fascia is sutured. In this manner the patient requires very little ether and is entirely out of the anesthesia before the operation is completed, and only mild or no signs of shock are apparent. Rarely does the patient complain of having suffered from pain during the operation.

To date, 250 patients have been anesthetized in this manner, and not a single death or complication has occurred which could be attributed to the anesthesia.

ANKYLOSIS OF THE MANDIBLE AND ITS OPERATIVE TREATMENT.

CHUBB (*Proceedings of the Royal Society of Medicine*, Vol. XIII, No. 2, 1919) reports five cases of closure of the jaw. Four were traumatic in origin, with fracture of the zygoma, with or without direct involvement of the coronoid, but without involvement of the temporomandibular joint. The fifth case, which was bilateral, was infective in origin and was due to an acute arthritis of the temporomandibular joint in infancy. In each case, however, there had been infection in the zygomatic fossa, and in each case, quite apart from any direct involvement of the coronoid in the injury, there was a definite fixation of this structure, by the development of fibrous or bony adhesions, to the lower part of the pterygoid aspect of the maxilla.

The incision and mode of approach to the pterygoid fossa used in operating upon these cases not only allowed of an easy approach to this region without risk of injury, temporary or permanent, to the branches of the facial nerve, but allowed also of the complete subperiosteal resection of the coronoid and condylar region of both sides without materially affecting the subsequent power of mastication.

The condition was, in each case, relieved by the complete resection of the coronoid. In the purely infective case this was removed on both sides, together with the condylar neck region of the ascending ramus on each side. The operation was the same for each, and was devised to allow of the complete resection of the coronoid process down to its base, without unduly interfering with the muscles of mastication, and without risk of injury to the branches of the facial nerve. The operation was found to give an admirable approach to the pterygoid fossa, and to permit of the resection of the condylar region also, where this became necessary. The scar is almost entirely in the hair region, and therefore practically invisible. In none of the cases was there any involvement of the facial nerve. And in every case there was free and painless mastication of surprising efficiency within a few weeks of the operation.

The incision differs considerably from those hitherto described for operations in this region, and has the three following advantages: It avoids all branches of the facial nerve; it is confined almost entirely to the hair region; and it gives a free and wide approach to the pterygoid fossa. It starts in the preauricular fold of the lowest level of the external meatus, and passes vertically upwards to about the level of the top of the pinna, from which point it curves gently forward a little below the superior temporal crest, terminating well within the hair area of the temporal region. The incision is carried directly down to bone. The skin, temporal fascia, and temporal muscle are separately defined and turned forward. The deeper of the two layers into which the temporal fascia splits

as it approaches the zygoma is divided from its deep aspect, and the more superficial layer—still working from its deep surface—is separated from the outer surface of the zygoma with the raspatory. The zygoma is resected piecemeal with the gouge forceps from immediately in front of the eminentia articularis posteriorly to as far forward as to include a portion of the malar bone anteriorly. For this resection and for the remainder of the operation the surgeon stands at the head of the patient and approaches the zygomatic fossa from above—that is, by way of the temporal fossa.

The tip of the coronoid can now be readily felt. Its upper and posterior portion is defined by severing the more posterior fibers of the temporal muscle close to the bone, upward traction of the muscle being performed at the same time. The coronoid is now cleared of its muscular attachments with the raspatory and is then resected piecemeal with gouge forceps, guided by the finger, until the anterior border of the ascending ramus passes in a smooth curve down to the commencement of the alveolar border of the horizontal ramus.

In this resection the surgeon is working between the deeper fibers of insertion of the temporal muscle and the belly of the external pterygoid on the one hand, and the under surface of the masseter muscle as this passes to its insertion into the outer face of the coronoid and angle on the other. Anteriorly and inferiorly ordinary care is sufficient to avoid injury to the mucous membrane covering the lowest portion of the coronoid, and separating the latter from the oral cavity.

In actual practice, the difficulty experienced in the removal of the coronoid varies enormously, according to the nature and extent of the injury, and the degree of ankylosis to the surrounding bones.

In cases in which only the coronoid is to be removed, the operation is completed by stitching back the temporal fascia and muscle into place and closing the skin incision, a small drainage tube being left in the wound for forty-eight hours. In the fifth case it was necessary to resect the neck of the condyle also. This was done, partly through the temporal incision already described, the neck being attacked on its anterior aspect with curved gouge forceps. On account, however, of the large and very hard mass of bone occupying the site of the joint in this case, and in order to minimize the risk of injury to the internal maxillary artery, the resection was completed from behind, the lower border of the angle being defined by means of a horizontal incision below this region, and the condylar neck reached by a subperiosteal resection of the posterior border of the ascending ramus. This second incision was also useful for the "Murphyrization" of the future pseudarthrosis by means of the posterior portion of the temporal fascia and muscle, which was turned down, brought through the gap made by the resection of the condylar neck, and secured in the deeper layers of the lower wound.

GUNSHOT WOUNDS OF THE LARGE INTESTINE AND RECTUM, WITH SPECIAL REFERENCE TO SURGICAL TREATMENT.

DRUMMOND (*Proceedings of the Royal Society of Medicine*, Vol. XIII, No. 2, 1919) quotes Dr. Arthur Keith to the effect that a review of the reports of cases of gunshot wounds of the large bowel and examination of specimens had led him to the conclusion that retroperitoneal wounds of the colon or rectum and infection of the pelvic subperitoneal tissue were just as fatal as penetration of the peritoneum with intraperitoneal laceration of the bowel. Retroperitoneal infection causes a more serious lesion and one more frequently fatal than in the case of lesions limited to the peritoneum and laceration of the large bowel, and for the following reasons: First, because of the extraordinary power possessed by the omentum and peritoneum in dealing with septic organisms, especially the anaerobic varieties; and secondly, on account of the comparative ease with which wounds can be exposed when limited to the

peritoneal portions of the gut. The retroperitoneal tissue on the other hand when infiltrated with blood in the presence of a damaged gut forms an ideal nidus for the growth of organisms, and the exposure to provide adequate drainage, especially in and around the pelvis, is most difficult.

The author publishes a table showing that out of 57 colon cases operated upon there were thirty-seven deaths and twenty recoveries; of the thirty-seven fatal cases nineteen died of shock and sixteen of retroperitoneal infection, two died of peritonitis, one of which was accompanied by retroperitoneal sepsis. From the table of gunshot wounds of the rectum there were fourteen deaths out of sixteen cases, with two recoveries; seven died from shock, six from retroperitoneal sepsis, and one from peritonitis with retroperitoneal sepsis. In the majority of these cases careful post-mortem examinations were made by competent pathologists. The most common colon areas for the development of fatal retroperitoneal infections are along the ascending and descending portions of the bowel where the mesentery is absent.

It is now generally agreed that the abdomen should be opened in every case except in low buttock wounds where we can be certain that the missile has not either directly or indirectly injured the peritoneum.

Intraperitoneal wounds of the rectum low down in the rectovesical pouch are most difficult to treat by suture on account of the depth of the narrow male pelvis.

These intraperitoneal rectal wounds are frequently accompanied by much laceration of the lowest coils of the ileum as it lies in the true pelvis, and also by injury of the bladder, and severe compound fracture of the pelvic bones. In six of the sixteen cases in this series the small bowel was perforated, and the bladder ruptured four times, whilst the sacrum and pelvic bones were fractured in eight cases.

In extraperitoneal wounds of the rectum the only hope of success lies in very free local drainage carried out at the earliest possible moment.

Too much must not be expected from colostomy in subperitoneal wounds of the rectum, especially in the type already described, where the impact from a blow on the sacrum produces a laceration of the underlying muscular tissue and rupture of the small vessels, resulting in very rapid gangrene of the mucous membrane of the gut; and likewise where the actual gangrenous patch occurring in the bowel is separated from the track of the missile by a layer of undamaged tissue, as in a case reported. This ulceration and gangrene may occur as early as seven hours after the infliction of the wound.

In these cases, in which the infection to the retroperitoneal tissue is established almost directly, colostomy can be of little service as a primary measure, as one might just as well perform an enterostomy in the hope of curing a case of acute gangrenous appendix; indeed the only rational line to adopt is to expose and, if possible, excise the local gangrenous patch in the rectum. Moreover we know that the intestine remains motionless for a considerable time after injury, as has been proved clinically when the missile has taken a superficial course through the abdominal wall and wounded the small intestine in its immediate neighborhood, the injured coils being found in the same place after a considerable interval.

GASTRIC ULCER TREATED BY NERVE BLOCKING.

PARKER (*New York Medical Journal*, March 6, 1920) makes a preliminary report on cases of gastric ulcer treated by nerve blocking.

In 1897, Dr. Celestino Alvarez, of Oviedo, Spain, removed a lipoma from the back of a woman, aged forty, who at that time was also suffering from gastric ulcer. During the operation the intercostal nerves were damaged. Two days afterward all symptoms of ulcer disappeared and did not recur. The patient died eight years later of pulmonary tuberculosis. Profiting by his observations in this case, Alvarez de-

vised the operation of bilateral avulsion of the fifth, sixth, seventh, eighth and ninth intercostals for the treatment of gastric ulcer. As a result of this procedure he found that the gastric juice always diminished in quantity and acidity. It is most essential, he says, to destroy the fifth intercostal, but avulsion of all ten is necessary to effect a cure.

Alvarez proceeds as follows: Under chloroform narcosis he makes two parallel incisions about 7 cm. in length, one on either side of and two fingerbreadths from the vertebral column. He clamps both right and left fifth, sixth, seventh, eighth and ninth intercostals, severs these nerves distal to the instruments, and, utilizing the attached clamps as grips, by torsion and traction he thoroughly avulses the proximal stumps. The successful results following this operation were the subject of a paper read by Alvarez before the Royal Academy of Medicine in Madrid.

After reading his paper it occurred to Parker that the well-known alcohol nerve blocking technique might be substituted for the Alvarez avulsion method. A preliminary hypodermic of a quarter of a grain of morphine is given fifteen minutes before operation. The patient, sitting in a chair, leans forward over a table with arms fully extended above the head. The operation field is prepared in the usual manner. A long, strong hypodermic needle is inserted between the ribs about one and a half inches from the spine and is pushed forward until the resisting intercostal muscles are reached. Continuing a little beyond this resistance the nerve may easily be located, contact with the needle causing characteristic pain. About one-half Cc. of one-tenth of one-per-cent cocaine solution is injected. After a few minutes the first syringe is removed, leaving the needle in place. A second containing five to ten Cc. of sixty-per-cent alcohol is attached and the contained solution injected freely into and around the nerve. All ten nerves are similarly treated. Dr. Willy Meyer has described various successful methods of locating the thoracic nerves with the needle.

As the nerves are infiltrated the patients describe their sensations, which vary greatly, the sixth giving in practically all cases typical ulcer symptoms. A short time after the injection numbness is complained of in the abdominal wall and back. The following day an analysis of the gastric contents shows a reduction in free hydrochloric acid and total acidity.

Parker states that fourteen patients have been treated at St. Mary's Hospital. Seven have been free from symptoms ranging from three months to two and one-half years. Three suffer after overeating. One had a nephrectomy performed later and has remained well. One patient died after a colectomy, and one has had a relapse.

LARVICIDES.

MAYNE and JACKSON (*Journal of the Royal Army Medical Corps*, February, 1920) describe some experiences in which they demonstrated that freezing water seems to have a stimulating effect upon the larvæ of mosquitoes. They observed in field work not only larvæ killed in pools that had been treated with oils, but fish, frogs, water tortoises, and newts, and all in a very short period of time. They further observed, in shaking up oil in the water and drawing off the underlying water from the film, that the larvæ were killed very quickly by this oil in solution. In other words, the oil is toxic in itself and does not produce its desirable effect by only a mechanical film. A castor-oil film produced death from suffocation, but seemed to have no toxic effect. As to cresol, it was found that a dilution of 1 to 100,000 would kill in four hours, 1 to 1000 in four minutes. A small pool containing 36 cubic feet of water was treated with 3½ fluidounces of cresol or 1 part per 10,000. All insect life was killed in twenty minutes. After fourteen days in spite of rain no larvæ had reappeared. A pool containing 74 cubic feet of water was given three-fourths of an ounce of cresol, or 1 part in 100,000. Twenty-four hours later only a few larvæ could be found. A bleaching powder containing

26 per cent of available chlorine was tried. Dilutions of 1 to 1000 parts killed in four and one-half hours; 1:10,000 in forty-eight hours. Carbolic acid gave disappointing results; cresol was very much better. The form of cresol used was liquor cresol saponatus, and the "paraffin" was the ordinary burning kerosene.

ASEPTIC CATHETERIZATION OF THE URINARY BLADDER.

SORESI (*New York Medical Journal,* Jan. 3, 1920) thus describes a method of passing a catheter which requires little time and is applicable under many circumstances when the somewhat elaborate sterilization technique usually set down is not feasible.

The only requirements are the instruments—thumb forceps, catheter, any container and a flame, lubricant—and care in performing the catheterization.

The catheter is rolled upon itself, if the container in which it is going to be sterilized is very small, and is put into the container filled with a solution of about 15 per cent of tragacanth and boiled for about two minutes.

The person who is going to do the catheterization takes the catheter from the container with the thumb forceps, which have been sterilized, either by putting them into the container with the ends pointing downward or by passing the ends over the flame; the catheter is held between the index-finger and thumb of the left hand and unrolled with the help of the thumb forceps. The patient is instructed to hold his glans penis so as to compress the gland between the thumb and index-fingers in order to open the meatus. If the patient is unable to do this, it may be held by an assistant as described. When the meatus is well opened, the person who performs the catheterization holds the end of the catheter between the thumb and index-finger of the left hand, seizes the other end of the catheter with the thumb forceps about two centimeters from the tip and introduces the tip into the meatus, and, with the help of the thumb forceps, pushes the catheter into the urethra until the bladder is reached and urine appears. The introduction of the catheter by means of the thumb forceps is extremely easy when this simple technique is followed. The catheter is seized by the thumb forceps at about two centimeters from its tip and then introduced into the meatus. The catheter is pushed into the urethra until the forceps almost touch the meatus, then the forceps again take hold of the catheter at about two or three centimeters from the meatus and introduce the catheter into the urethra until the thumb forceps almost touch the meatus, and this maneuver is repeated until the entire catheter has been introduced. In introducing the catheter attention should be given to see that the tip is put into the urethra without touching the meatus, and when the catheter is being pushed into the urethra the forceps should never touch the meatus; and to avoid touching it, it should always stop three or four millimeters from the meatus.

If the technique described is followed it is evident that an aseptic catheterization of the urinary bladder is obtained, and it is obtained by the simplest means that can be employed by any one having a little common sense. The author was gratified by the results he obtained during the war, when catheterization had to be resorted to frequently, especially in cases of injury to the spine. Catheterization was frequently done by nurses, who previous to service in the medical corps were masons, bootmakers, and farmers, none of them having had real training.

MOUTH INFECTION AS A SOURCE OF SYSTEMIC DISEASES.

FEDERSPIEL (*Wisconsin Medical Journal,* February, 1920), after reporting a number of clinical cases greatly benefited by attention to the teeth, states that in the examination of the mouth in order to determine whether there is any contributing causes that might bring on complaint, it is well to observe the following:

Careful inspection of the teeth, the number missing, the number of dead teeth, the occlusion and the forces of mastication.

Inspection of the mucous membrane of the entire oral cavity. The mechanical construction of artificial teeth, such as crowns, bridges, and fillings; the contour of the fillings, and to ascertain whether there are any overhanging margins which will permit the accumulation of particles of food and other foreign substances.

Exploring the attachment of the soft tissue at the gingiva to ascertain whether there are any pockets; tartar that may be found around the teeth; and upon palpation whether there is any pus oozing from the gum margin.

The testing of the teeth with electrical current to ascertain the vitality of pulps.

A complete *x*-ray examination of the teeth.

These five simple rules should enable the diagnosticians to work out a better and more complete diagnosis.

PSEUDO-APPENDICITIS.

LINK (*Journal of the Missouri State Medical Association,* January, 1920) concludes a paper upon this subject by stating the following signs have proven helpful in the diagnosis:

Horn's sign: Traction on spermatic cord causes severe pain.

Bastedo's sign: Pain in the right iliac fossa on inflation of colon with air.

McBurney's sign: Pressure at McBurney's point causes pain in that region.

Wacherheim's sign: Rectal palpation. Finger must be introduced painlessly and slowly toward right iliac fossa; hand gloved and well lubricated. If appendicitis, sharp pain is elicited.

Psoas muscle counter-pressure: Patient with extended limb raises foot while lying in a horizontal position and the examiner makes gentle pressure over McBurney's point. This will be painful in case of appendicular pathology.

Aaron's sign: Continuous firm pressure with ends of the first three fingers over McBurney's point frequently induces distress or pain in epigastrium, left hypochondrium, umbilical region. Also while such pressure is produced under roentgen-ray therapy pylorospasm may be noted.

Castor-oil test: When a large dose of castor oil is administered to a patient with chronic appendicitis it will cause an exacerbation.

PROTECTION OF THE SKIN FROM IRRITATING DISCHARGES BY SHEET RUBBER.

SORESI (*Surgery, Gynecology and Obstetrics,* March, 1920) suggests the following plan which he has found successful:

Before the operation the intended line of incision is marked out, the skin is cleaned and dried with ether and painted with a solution of rubber cement dissolved in about five parts of ether, for about 2 centimeters all around the intended line of incision. To the skin so prepared is applied a piece of sheet rubber of sufficient size to cover the area of skin that might later come in contact with the irritating material. The sheet rubber is gently compressed against the skin, as it is done when a patch is put on a rubber glove, on a tire, or any other rubber material. The surgeon then makes the incision in the usual manner, obviously first cutting the sheet rubber, then the skin, and then the deeper structures. Along the line of incision the sheet rubber will have adhered to the cut edges of the skin, so that no material that could come out of the wound would ever touch the skin, which in this manner is completely protected from contact with any irritating material.

If the solution of ether and rubber has been allowed to stand some time and the sheet rubber is sterilized, the surgeon can cut through the sheet rubber without any previous preparation of the skin with tincture of iodine, because the wound will positively not be infected by the incision, after the skin has been protected with rubber ether cement. As explained in another paper, the author strongly deprecates the use of tincture of iodine previous to the painting of the skin with the ether rubber solution and the application of the sheet rubber, which, we repeat, are sufficient to protect against infection.

When the surgeon has to deal with an open wound, the procedure is the following: The skin around the wound is cleaned and then dried with ether; rubber ether cement solution is applied for about 2 centimeters around the wound; sheet rubber is applied over the whole wound, which can be filled, if deemed necessary, with sterile dry gauze. The sheet rubber is compressed against the skin, and the rubber is then cut in the middle and trimmed all around the wound.

The sheet rubber must be of good quality; dentist dam is the best. Common rubber tissue is too brittle.

If the skin needs only to be protected for a few days, the rubber cement ether solution, applied rather thick, will be sufficient.

The sheet rubber should adhere to the edge of the wound only for about 2 centimeters all around it. Obviously there would be no advantage in having all the sheet rubber adhere to the skin.

REVIEWS.

THE MEDICAL CLINICS OF NORTH AMERICA. March, 1920. W. B. Saunders Company, Philadelphia. Price: Cloth $16, Paper $12, per year.

This issue, which is No. 5 of Volume III, contains the reports of eighteen clinics given at different hospitals in Philadelphia, chiefly the Jefferson Medical College Hospital and the University Hospital. Amongst them we find two by Beardsley of the Jefferson—one on Chronic Valvular Heart Disease, and the other on Ethics, Ideals, and Efficiency in the Practice of Medicine; Mohler of the same institution discusses Diabetes Mellitus in Children; Elmer H. Funk has one upon Malignant Disease of the Lung; while McCrae writes on that important subject, Low Blood-pressure.

Amongst the other contributions is one by Deaver on Chronic Appendicitis; another by Hopkins on The Treatment of Catarrhal Jaundice; and one by Doane of the Philadelphia General Hospital on Drug Inebriety.

As in previous issues, the type is large, the spacing is good, and the text is well chosen and interesting.

MANUAL OF SURGERY (ROSE AND CARLESS). By Albert Carless, C.B.E., M.B., M.S. Lond., F.R.C.S. Tenth Edition. William Wood & Company, New York, 1920. Price $8.

This tenth edition of a popular, comprehensive and sound text-book follows its predecessor by five years, in which Surgery both in its fundamentals and its practical application has been somewhat changed and greatly enriched. In this present edition Carless has included many methods, some of them of transitory value and some which he states will probably be dropped in subsequent editions. He considers as the most valuable additions those made on the treatment of infected wounds, in dealing with compound fractures, especially in the shafts of long bones, and in making good the defects of war wounds. Many new illustrations have been added, and, as a desirable innovation the *x*-ray plates have been printed on art paper, thus obviating the blurring and loss of detail inevitable when they are included in the letterpress. The dedication is to the late Lord Lister, the Father of Antiseptic Surgery. It is arranged much in accordance with the accepted standards, beginning with Surgical Bacteriology, Inflammation, Examination of the Blood in Health and Disease; Non-Specific Pyogenic Infections; Ulceration; Gangrene; Specific Infective Diseases; Tumors and Cysts; Wounds, and the General Technic of Operative Surgery. Thereafter follows the practice of Surgery grouped in the main by systems. There is an appendix on Military Surgery.

As a general thing the book is well written and the subjects are excellently classified. The teaching is modern, the additions excellent. The revision suggests haste. For instance it is asserted on page 161 that it is now fairly certain that the cause of syphilis is a protozoal parasite, and

further that this organism can readily be distinguished from more unimportant forms by its morphology and staining reactions. It is further stated that the disease is transmitted by material obtained from the human in all stages. In discussing Enteroclysis by the drop method it is advised that the fluid be kept warm by a Thermos bottle. These are minor matters and perhaps add interest to the sound teaching characteristic throughout the work.

ORTHOPEDIC AND RECONSTRUCTION SURGERY, INDUSTRIAL AND CIVILIAN. By Fred H. Albee, M.D., F.A.C.S. W. B. Saunders Company, Philadelphia and London, 1919. Price $11.

This book, dedicated "to E. G. Brackett and others of the profession who have at great sacrifice offered their services to their country in an hour of great peril," is inspired with the thought that "the rapid and extensive evolution of this work, plus the epoch-making influence of the recent world-wide war, have justified the publication of a work which, while in no wise detracting from the importance of conservative methods, aims to assemble and bring to the attention of the profession in a practical manner those surgical procedures which have contributed so largely to the reclamation of the cripple and the rehabilitation of the physically incompetent." The book includes a consideration of many conditions originating in the present-day industrial organizations and the great war. Among the headings of chapters are found Fundamental Principles Underlying the Use of the Bone Graft in Surgery; the Electro-operative Bone Outfit and Technic of its Usage; Other Instruments; Focal Infections; Traumatic and Other Affections of the Spine; Malunited and Ununited Fractures of the Long Bones and Surgical Treatment by Bone Graft; Some Special Fractures; Spastic Paralysis, Neuropathies and Myopathies; Neoplasms of the Bone; Plaster of Paris Technic and Military and Reconstruction Surgery.

This volume is adequately illustrated, and includes a full description of the author's special instruments and of his ingenious technique. It is a book containing much original matter written in a clear and graphic fashion, so pictured as to make the text not only understandable but valuable both to the general surgeon and the orthopedist.

NOTES AND QUERIES.

THE USE OF ALCOHOL IN THE TREATMENT OF INFLUENZA.

The *Boston Medical and Surgical Journal* of May 20, 1920, calls attention to the following letter, written by Dr. Henry A. Christian, Professor of Medicine in Harvard University, to the Executive Secretary of the Scientific Temperance Federation of Boston, which appeared in the daily press:

"Your letter, asking what, in my judgment, should be said to the public as to the use of alcoholic liquors in the treatment of influenza, or as a preventive, gives me the opportunity of expressing certain opinions which I hold.

"In the first place, the use of alcoholic liquors in the treatment or prevention of influenza comes in the same category as the use of other remedial agents, namely, they should be used under the supervision of a physician. In the treatment of certain cases of influenza alcoholic liquors have a definitely useful place; which cases require alcoholic liquors is a matter to be determined by the physician, not determined by law or by popular sentiment. Alcoholic liquors, in my judgment, are of no service in the prevention of influenza.

"Temperance societies, like your own, are making a serious error in taking any part in the agitation for or against the use by physicians of alcoholic beverages in the treatment of disease. There is no more reason for them to express opinions in this

matter than there would be for them to express opinions as to the advisability or not of the use of digitalis in heart disease. Any sweeping statement for or against the use of alcoholic beverages in illness is unjustified; it is a matter for individual decision in individual cases.

"A serious mistake has been made by those who drafted the present prohibition laws in failing to make provision by which the druggist shall have accessible to physicians' orders an adequate supply of alcoholic beverages of good quality and reasonable price, and in failing to have put in operation, on the prohibition laws becoming effective, machinery by which such supplies were provided and by which all registered physicians' prescriptions should be received and filled without undue red tape leading to delay. There is no reason why such regulations should not be made as are needed to prevent alcoholic beverages intended for medicinal use being used by other than ill individuals on physicians' prescriptions. Such regulations, however, must be of a character not to prevent the prompt availability of alcoholic beverages wherever and whenever needed by ill individuals as determined by legally registered physicians. That such provision was not made is shown by the present conditions; the blame should be assumed by those responsible for these laws and the needed corrections should be made promptly by them. Temperance societies should be willing to give their help in having regulations passed which provide a simple machinery by which druggists may have in stock good alcoholic beverages at reasonable price and by which they may be prescribed and promptly obtained for ill patients.

"In my judgment, in their zeal for a cause, prohibition advocates have done the cause of prohibition harm both by being unwilling to allow to physicians the right to determine how they should treat disease in so far as the use of alcohol is concerned and by being too hasty or too thoughtless in their action to foresee the defects of the laws they supported with respect to provision for the use of alcoholic beverages in illness. In either respect they themselves have been intemperate; in the one case, intemperate in their claims to knowledge of medical science; in the other, intemperate in allowing the end sought to blind them to possible evils or errors in the laws seeking those ends.

"My advice to you and your office as to how to answer the question as to the advisability of the use of alcoholic beverages in influenza is that you should reply that this is a medical question to be answered by a physician, and not a question for you to answer owing to your lack of knowledge of medical science. There is no reason whatsoever why this information should pass through your office and many reasons against it."

THE OLD MATERIA MEDICA AND THE NEW.

Under the heading of Reviews and Notices of Books, the *Lancet* of March 20, 1920, says:

"The old materia medica is passing away, with its study of barks and roots and seeds and the preparation of mysterious compounds by bored and unwilling students. In its place has arisen the newer study of the action of the drugs in man and animals with more or less successful attempts to explain the way in which they affect disease. In most schools this discipline precedes attendance in the wards, or, at the latest, is taken in the beginning of the clinical work, when the student is still unfamiliar with the aspect of disease and can hardly be expected to follow very closely the changes wrought by treatment. This position in the curriculum, necessitated by the close dependence of pharmacology on physiology, results in a certain want of reality in the treatment of the subject, and in order to remove this a number of books on practical pharmacology have been issued of late years, chiefly in the United States. In some of these the student seems to be expected to spend his time, which must apparently extend over months, in performing ex-

periments on animals which would be formidable operations for a trained physiologist, and in which one would suppose that the chief interest must lie in the preparatory operation rather than in the drug action which it is expected to illustrate."

SOME TENDENCIES IN OUR MEDICAL SCHOOLS.

At present in this country the university professors in the laboratory branches have been given too large a part in reorganizing our university medical schools and in developing the medical curriculum. It is clearly our duty to call attention to this fact and see that this tendency is corrected. The first and highest duty of the medical school is to train competent practitioners of medicine, and this cannot be done by the college professor of embryology and comparative anatomy, or by the chemist working in a clinical laboratory, or by the research worker in some isolated medical institute. This problem is to be met by placing the reorganization of medical education in the hands of medical men.

1. The teachers of the laboratory branches should be required to have a medical training which would give them a medical point of view; they would keep in touch with the art and science of medicine, and would realize that their first duty was to assist in training practitioners of medicine.

2. The teachers of the clinical branches should have a broad medical training in both the science and the art of medicine; they should be great clinicians in their special fields, who understand not only what anatomy and physiology, pathology and pharmacology the student needs to acquire, but also what he needs to know to become an expert practitioner of medicine. Fortunately in the last twenty years many such men have been trained in this country.

The controlling element of a medical faculty must consist of a group of medical men in the closest touch with the science and art of medicine and with the medical profession. Such a group must have as its members the professors of medicine, surgery, obstetrics, and pathology. Such a group must control a teaching hospital and an out-patient department, with adequate clinical and pathologic material and well-equipped laboratories. This plant should be located where it can secure ample clinical material with little or no cost to the medical school.

There is no desire to belittle the importance of the laboratory branches in medicine. But a medical school is a school in which to train doctors and not anatomists or physiologists. If it fulfils its first and most important function, the training of practitioners of medicine, it will also be training teachers and research workers.—Report on Medical Education, *Journal American Medical Association,* May 1, 1920.